The COMMODORE-USERS' Monthly Journal

COMMANDER

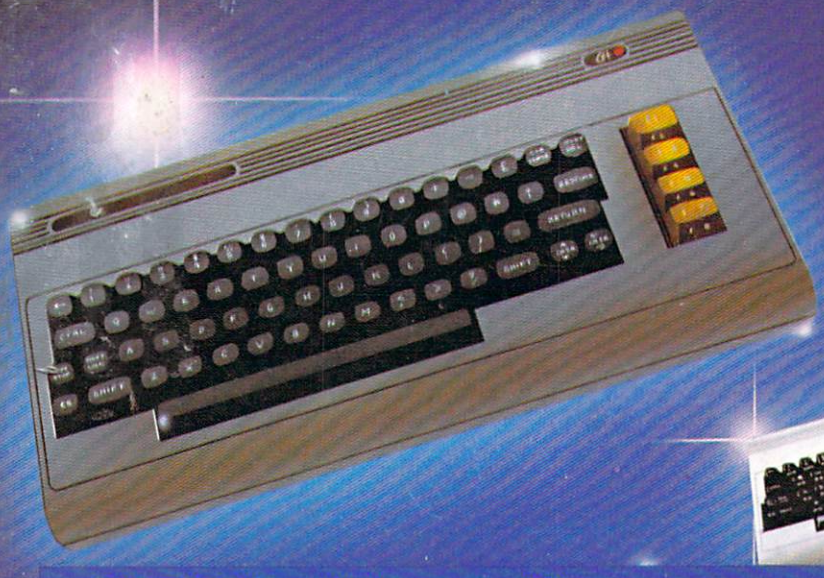
FEBRUARY 1984

$2.95 U.S.
$3.50 CAN.

C-64 VIC-20 "Z-128"

C64™

VIC 20™



- "MOSES" Revelations p. 52
- Keeping Your Files Straight p. 45
- Big Brother and Little Sister
- How to Start Your Own Software Company p. 70
- **Original Game Programs for the C-64 and VIC-20**
- **Software Review for Business, Education, Recreation**

And More . . .

0 74470 12426 02

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • **COMMODORE 64**

The VERSABUSINESS™ Series

Each **VERSABUSINESS** module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

SATISFACTION GUARANTEED!

Every **VERSABUSINESS™** module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any **VERSABUSINESS™** module, you may return it within 30 days for a refund. Manuals for any **VERSABUSINESS™** module may be purchased for $25 each, credited toward a later purchase of that module.
All CP/M-based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC-80)

To Order:
Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add $3 for shipping in UPS areas
- add $4 for C.O.D. or non-UPS areas
- add $5 to CANADA or MEXICO
- add proper postage elsewhere

VISA

DEALER INQUIRIES WELCOME

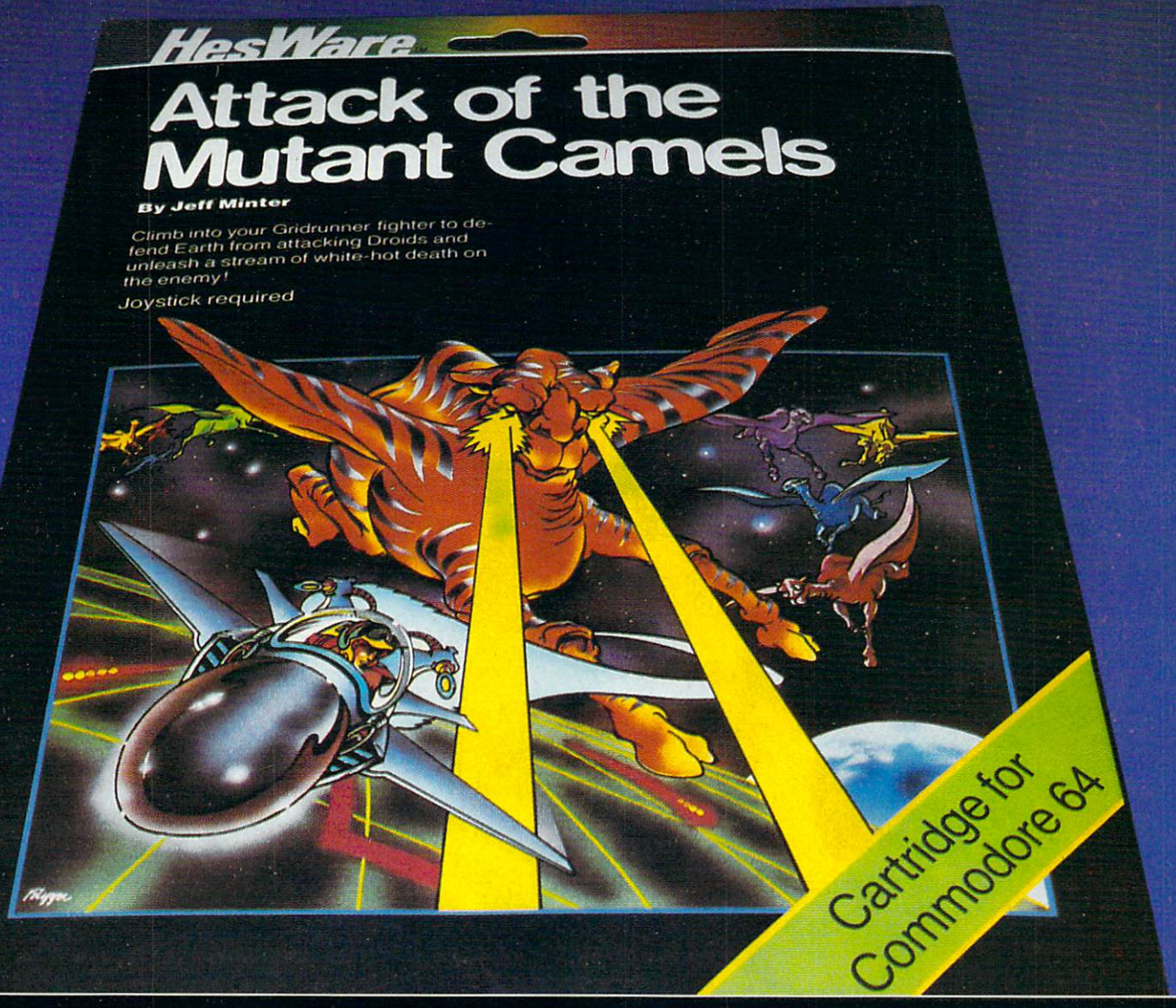
All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

TRS-80 trademark Tandy Corp. - APPLE trademark Apple Corp. - IBM PC trademark IBM Corp. - OSBORNE trademark Osborne Corp. - XEROX trademark Xerox Corp. - KAYPRO trademark Non-Linear Systems, Inc. - TELEVIDEO trademark Televideo Systems, Inc. - SANYO trademark Sanyo Corp. - NEC trademark NEC Corp. - DEC trademark Digital Equipment Corp. - ZENITH trademark Zenith Corp. TI PROFESSIONAL COMPUTER trademark Texas Instruments, Inc. - SUPERBRAIN trademark Intertec Corp. - CP/M trademark Digital Research - EPSTON trademark Epson Corp.

GRIDRUNNER SURVIVORS BEWARE!


HesWare
Attack of the Mutant Camels
By Jeff Minter
Climb into your Gridrunner fighter to defend Earth from attacking Droids and unleash a stream of white-hot death on the enemy!
Joystick required
Cartridge for Commodore 64

The deadly 'Droids' almost got you the first time. Now they're back—and more dangerous than before in Attack of the Mutant Camels!

Are you tough enough to meet the challenge? Your new combat ships maneuver brilliantly—on *and* off the power matrix. And your powerful plasma cannons can destroy the fiendish invaders.

But you've got to be strong, quick, and clever. Because they've got even more sophisticated weapons this time. Like planes that fly at crazy angles. Forcefields that redirect your firepower right back at you. And with their bizarre disorientation tactics—the mutant camels could make you lose your mind.

Twenty attack waves, each with a different screen, test your skills and provide increasingly challenging levels of play. Clear a wave and earn an extra ship.

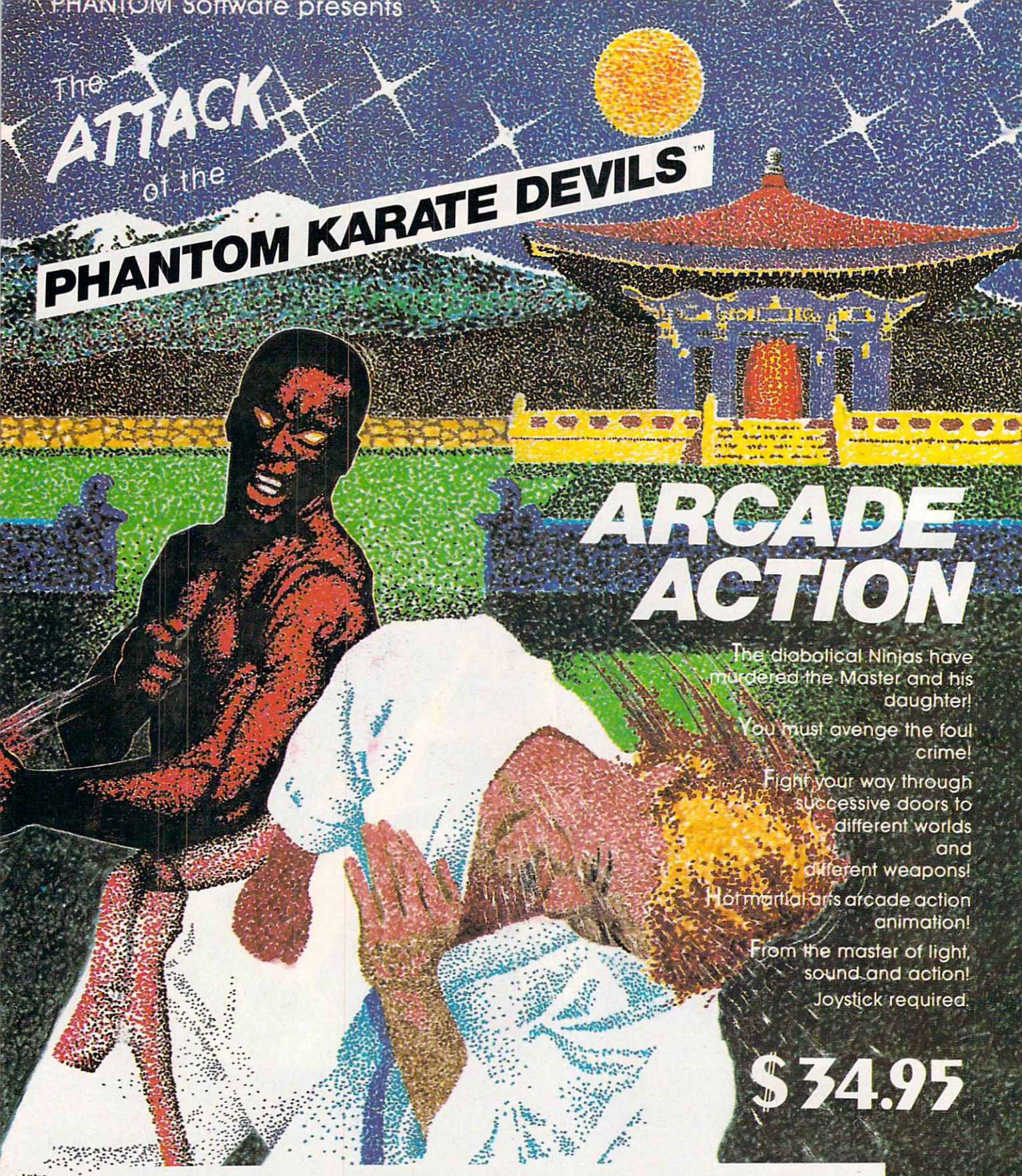
Can you destroy the Droids and save the Earth? Only your local software dealer can help you find out.

Human Engineered Software
150 North Hill Drive
Brisbane, California 94005

HesWare

Attack of the Mutant Camels is a TM of H.E.S.
Commodore 64 is a TM of Commodore.

Circle No. 107


PHANTOM Software presents
The ATTACK of the
PHANTOM KARATE DEVILS™
ARCADE ACTION
The diabolical Ninjas have murdered the Master and his daughter!
You must avenge the foul crime!
Fight your way through successive doors to different worlds and different weapons!
Hot martial arts arcade action animation!
From the master of light, sound and action!
Joystick required.
$34.95

Just released for the Commodore 64®. Also available - Surf, and Particle Beam War.

See your local dealer, or order direct from:

VISA PHANTOM Software MasterCard

1116-A 8th St. • Suite 155 • Manhattan Beach, CA 90266 • (213) 379-8686

Send Check or Money Order.

Specify Tape or Disk. Add $2.00 for shipping. Calif. residents add 6.5% tax.

Circle No. 75

©1983 Marc Engle

T&F SOFTWARE

CheckEase!™

Professional-Quality Checkbook:

For VIC-20 and Commodore 64

Now you have the power of a professional quality Check Register System. Maintain multiple checking accounts, complete with full checkbook reconciliation and 16 budget categories. Change or delete any check, check or deposit amount, or deduction and CheckEase! will automatically update all balance figures. Review checks forward, backward or by check number. Configure for RS232 or compatable Commodore printer. Post checks as they clear the bank. Upgrade data from cassette to disk. Print by check number, category or if item is tax deductable. Commodore 64 and VIC-20 users can even save months worth of check data in a format compatable with Commodore's *Personal Finance* package for later analyzation.

$24.95 cassette (VIC-20 min. 8K),

$29.95 cassette: Commodore 64,
*Atari 400®/800®/1200 XL®

$34.95 disk: Commodore 64,
*Atari 400®/800®/1200 XL®,
*IBM PC, *APPLE II/IIplus/IIe®

SearchSeries™

First with Arcade-Quality Games:

For VIC-20 and Commodore 64

There are 374 letters on the screen. Concealed within are 20 words: 10 across and 10 down. You have 10 minutes. When you've found a hidden word, it changes color. Every game features a new screen. Over 300 different words and thousands of new games possible. **$19.95** on cassette.

WordSearch 3 categories: Capitals, Jumbled and Animals.

SportSearch 3 categories: Pro Teams, College Teams and Sport Games.

ArcadeSearch 3 categories: Home Video Games, Arcade Video Games and Famous Video Game Characters.

Space Sentinel™

For Commodore 64

Planet Earth is under attack by ruthless aliens who hurl heat missles at our polar ice caps. Will the Earth flood? As the orbiting Space Sentinel, the Earth's fate is up to you. If you can hold out against the merciless attackers, Earth's population will have time to escape and colonize a new home planet. Complete sprite & character graphics with 3-voice sound. **$29.95** on disk. Joystick, Diskdrive & Commodore 64® required.

*AVAILABLE 4TH QUARTER '83

Available at finer Software Stores everywhere.

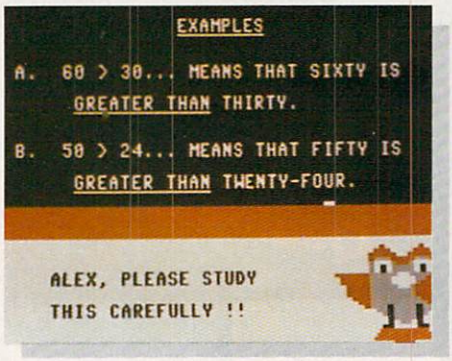
Or Call (213) 501-5845 for the name of your local dealer or distributor.

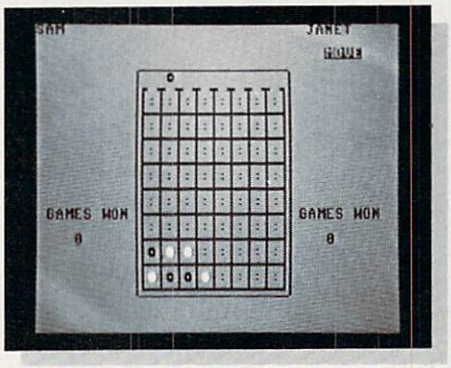
Circle No. 79

T&F SOFTWARE

T&F Software Company 10902 Riverside Drive / North Hollywood, California 91602. (213) **501-5845**

© COPYRIGHT 1982, 1983 BY T&F SOFTWARE. SPACE SENTINEL IS A TRADEMARK OF MEGAGEM. CHECKEASE IS A TRADEMARK OF GMS SYSTEMS. SEARCH SERIES, ARCADESEARCH, WORDSEARCH, SPORTSEARCH ARE TRADEMARKS OF GEORGE DENNIS. VIC-20, COMMODORE 64 AND PERSONAL FINANCE ARE REGISTERED TRADEMARKS OF COMMODORE COMPUTERS, INC. AND CREATIVE SOFTWARE. ATARI 400/800/1200XL AND IBM P.C. ARE REGISTERED TRADEMARKS OF THEIR RESPECTIVE COMPANIES.


EXAMPLES
A. 60 > 30... MEANS THAT SIXTY IS GREATER THAN THIRTY.
B. 50 > 24... MEANS THAT FIFTY IS GREATER THAN TWENTY-FOUR.
ALEX, PLEASE STUDY THIS CAREFULLY !!



This month's cover suggests that COMMODORE has built its reputation by producing out-of-this-world products at down-to-earth prices. Soon we'll be able to say whether the new 16-bit "Z-128" (or whatever its official designation will be) is any more than pie-in-the-sky.

COMMANDER Magazine is an independent publication, and has no formal relationship with Commodore Business Machines, Inc. other than as a paid advertiser. Submission of a manuscript by an author is considered an offer of exclusive publication rights. Opinions expressed by writers in articles and reviews are not necessarily those of *COMMANDER* Magazine.

Master

EDUCATION SECTOR

29 **Introduction to Assembly Language Programming, Part XIII: Wedges** / ERIC GIGUERE — C-64 & VIC-20 (Utility program)
Enjoy another installment in our popular series which teaches about assembly language in understandable terms.

34 **Electronic Blackboard** / MARYANNE DODD — GENERAL (Reviews)
This month's review of educational software focuses on three math packages for the C-64.

37 **BASIC Education: Programming for Learning, Part II–The Quiz** / ANDY VAN DUYNE — C-64 & VIC-20 (Application program)
Develop your own educational programs and copy an easy-to-use, general quiz-writing program.

45 **The Pro Gram** / JERRY B. BYRD — GENERAL
For intermediate level programmers, learn the differences between program, sequential, relative, and user files.

49 **Data Organization for the VIC-20: Part III** / ARTHUR J. DUDLEY — VIC-20
Further explore the intricacies of how data is stored in the VIC's memory chips.

REVIEWS AND RECREATION SECTOR

52 **Review of MOSES, A Full-featured 65C02 Assembler for the VIC-20** / GLEN COLBERT — VIC-20 (Review)
Assembly language programmers, this may be just the product you've been looking for.

73 **Deathstar** / ALAN L. KEYSER — VIC-20 (Game program)
You know what they say about all work and no play! This visually stimulatiing and challenging game is just what you need at the end of a long day.

78 **Connect 4** / MARK DAILY — C-64 (Game Program)
Even C-64 owners deserve some relaxation. Enjoy this two-person game with a friend.

86 **Invasion** / GENE BUCKLE — VIC-20 (Game program)
Introducing a new subsector, exclusively for junior programmers.

87 **Battle Hymn** / HARRY METZ — C-64 (Music program)
Get the electrons flowing in your C-64 sound chip, and perhaps learn something about music programming in the process.

99 **Software Reviews** / DENNIS KELLEY / ROBERT PARR — C-64 & VIC-20 (Reviews)
From racing forms to business forms to shapeless forms.

Menu

FEATURES SECTOR

GENERAL (Reviews) — **Living With . . . 1984** / COLIN F. THOMPSON — 14
How to make the best use of your computer in the year of Big Brother.

GENERAL (Reviews) — **Command Post** / JIM GRUBBS — 20
Can the amateur radio and the microcomputer coexist in the same universe? Read this monthly column to find out.

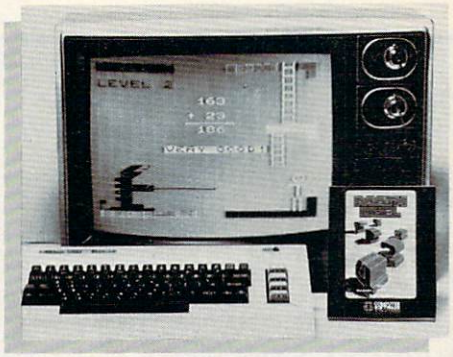
GENERAL — **Duplicating Data Cassettes** / JIM GRUBBS — 27
Everything you always wanted to know about getting the most from your datasette.

C-64 (Reviews) — **Business Software for the C-64** / WILLIAM L. SIMON, PH.D. — 57
For the money-conscious businessperson, here is a comprehensive review of useful software designed for that "best buy" computer.

GENERAL — **Support Your Local Programmer** / JIM GRUBBS — 70
If you ever dreamed of turning your computer into a money maker, here are some tips to help you try.

C-64 & VIC-20 (Utility Program) — **"Portable" Screen Control Symbols** / NOEL NYMAN — 83
One way to make your Commodore BASIC programs readable from any printer.

C-64 (Utility program) — **High Resolution Screen Dump for C-64** / ROBERT PARR — 91
Make a pixel by pixel printout of any screen image on a non-Commodore printer.



HARD SECTOR DEPARTMENTS

Editorial / DONALD ELMAN — 6

News Releases — 96

New Products — 104

REMs to Readers (from *COMMANDER'S* staff) — 108

ReCommand: Updates and Corrections to Previously Published Material — 111

Key-Mander: How to Type in BASIC Programs from *COMMANDER* — 116

Command Board: High Scorers in Computer Games — 118

Letters to *COMMANDER* — 122

Game Contest — 125

Advertisers Index — 143

COMMANDER Magazine, USPS 703-690, ISSN 0746-3197, is published monthly by Micro Systems Specialties, 3418 S. 90th St., Tacoma, WA 98409. Domestic subscriptions: 12 issues, $22.00. Second class postage paid at Tacoma, WA 98413 and additional mailing offices. POSTMASTER: Send address changes to *COMMANDER* Magazine, P.O. Box 98827, Tacoma, WA 98498. Entire contents copyright ©1983 by Micro Systems Specialties. All rights reserved. Commodore 64, VIC-20, B-128, and PET are trademarks of Commodore Business Machines, Inc. Issue No. 14.

Editorial

Publisher
THOMAS L. ROSENBAUM

Editor
DONALD ELMAN

Publication Manager
CINDY SHACKLEFORD

Marketing & Advertising
ELIZABETH K. STEAN, Director
LORI E. CLARK

Circulation
MARY OSBORN, Director
DEE ANDERSON
PAULA M. ANDERSON
EVA R. JONES

Design and Production
SCOTT A. MACDONALD

Technical Consultants
JOHN GABBARD
GEORGE R. GAUKEL
HOWARD ROTENBERG
COLIN F. THOMPSON

COMMANDER is published monthly by:
MICRO SYSTEMS SPECIALTIES, P.O. Box 98827,
Tacoma, Washington 98498

COMMANDER MAGAZINE
Regional Advertising Offices

Home Office, P.O Box 98827,
Tacoma, Wa. 98498. (206) 584-6759

Garland Associates, P.O. Box 314 S.H.S.
Duxbury, Mass. 02332.
(617) 934-6464 or 934-6546

Subscription Rates (U.S. Funds)	*Per Year*
U.S.	$22.00
Canadian, Mexican	$26.00
Surface Rates, Foreign	$37.00
Air Mail, Foreign	$75.00

For back issues, subscriptions, change of address or other information, write to:
COMMANDER
P.O. Box 98827
Tacoma, Washington 98498
(206) 584-6757
BACK ISSUES—
$3.50 each plus $1.00 each for shipping

Copyright© 1983 by MICRO SYSTEMS SPECIALTIES
All Rights Reserved

WHAT'S NEW?

Since this issue of *COMMANDER* is scheduled to reach you shortly after the start of another year, there are many possible answers to the question posed above.

A BASIC programmer's response might be, "NEW is a mixed-blessing command. Sometimes it can be used to cancel your errors with no telltale evidence. Other times, if invoked casually or unintentionally, it can wipe out the fruits of many hours' labor."

The mere passage of time can have much the same effect. We start each year with fresh plans and expectations, hoping to abandon our previous problems or weaknesses. Yet, if we embark upon such a new path that the past is totally cut off, we may lose all the benefits of experience and could be doomed to repeat mistakes.

These lessons would certainly apply to organizations that manufacture small computers, such as Commodore, as well as those which serve the needs of the computer marketplace, including *COMMANDER* Magazine. Over the next year we'll be taking a close look at the new Commodore products that are becoming available about now–the "Executive" (Is it any more than a C-64 with a disk drive and tiny monitor stuffed into a suitcase?), the B-128 (Shall we shed a collective tear for the last PET to come off the assembly line?), and that tantalizing new machine with which Commodore promises to make the leap to a 16-bit computer at 8-bit prices (Will it be called the "Z-128" as speculated on our cover, or will some other letter or number be more appropriate?). In any event, we hope and trust that Commodore's NEWest endeavors are not destined to repeat some of the supply problems that have developed in the past.

The new year also brings a number of changes at *COMMANDER* that we believe will improve our service to you. To name a few, there are new personnel (see adjacent masthead), a new publication schedule (we are now available *early* in the month preceding the cover date), a new program listing standardization (explained elsewhere in this issue), and a new article organization. For example, we have a regular "education" section devoted to educational software, applications, and programming instruction. Your comments and suggestions are always welcome.

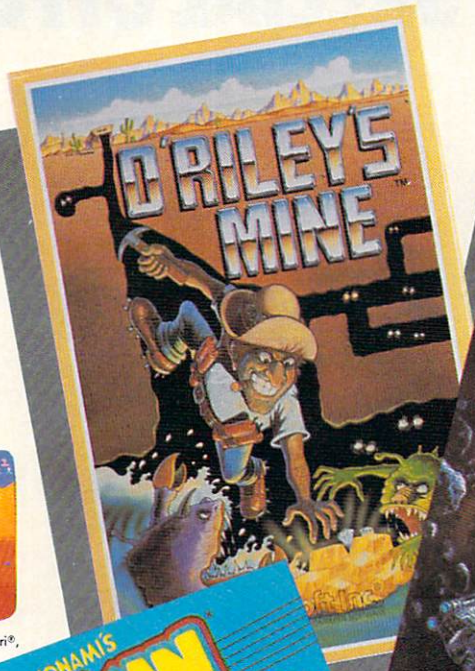
Finally, as we move into the year of Big Brother, it appears that Orwell's vision of electronic instruments becoming the tools of tyrants has been overshadowed by the reality of computers for the masses. To our readers we wish a very HAPPY NEW YEAR, and pleasant computing in 1984. May all your resolutions be high, your inputs acceptable, and your syntax error-free.

TURN YOUR COMMODORE-64 INTO THE HOTTEST ARCADE MACHINE IN TOWN

O'RILEY'S MINE™

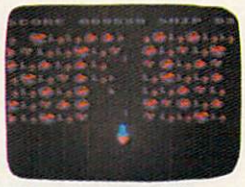
You're a mad Irishman digging your way through an abandoned mine filled with oil, coal, gold, rubies, diamonds—and hungry creatures. You'll need the luck of the Irish to survive, but with so much at stake, it's a chance you're willing to take.

O'RILEY'S MINE™ available for Atari®, Apple® and Commodore 64®

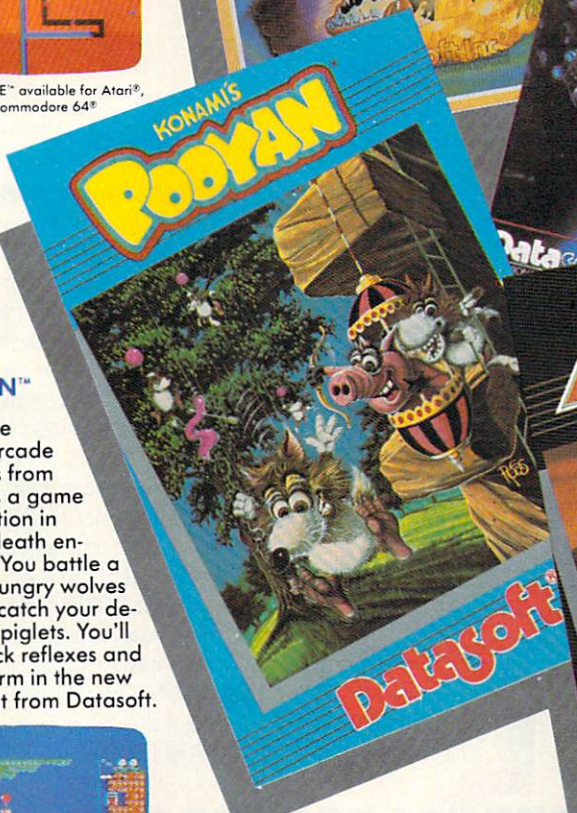


MOON SHUTTLE™

Your screen explodes with life-threatening action as you pilot your Moon Shuttle through outer space in this home version of the Nichibutsu® favorite. Awaiting you is The Prince of Darkness and his forces, which mysteriously multiply!



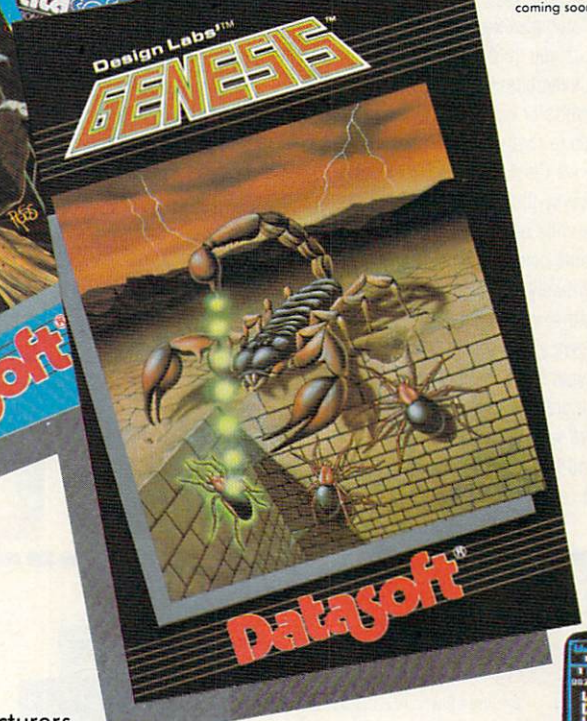
MOONSHUTTLE™ available for Atari®, Radio Shack Color®, Commodore 64®, coming soon for Apple®



POOYAN™

One of the biggest arcade game hits from Konami is a game of fast action in life-and-death encounters. You battle a pack of hungry wolves eager to catch your defenseless piglets. You'll need quick reflexes and a good arm in the new arcade hit from Datasoft.

POOYAN™ available for Atari®, Radio Shack Color®, Apple®, coming soon for Commodore 64®



GENESIS™

Balanced on the edge of disaster, you are the deadly King Scorpion defending your domain against fatally venomous spiders. Genesis captures all the intensity of Design Labs' arcade version of the first great battle on earth.

GENESIS™ available for Atari®, Apple®, IBM-PC®, and Commodore-64®.

Our reputation as one of the premier game manufacturers assures you of the highest quality attainable in action, strategy and graphics. For the hottest titles in entertainment, keep your eye on the leader—DATASOFT.

You'll Find The Best In Home Computer Software from Datasoft®

Pooyan™ is a trademark of Konami Industries Company, Ltd.

O'Riley's Mine® and Datasoft® are registered trademarks of Datasoft Inc.

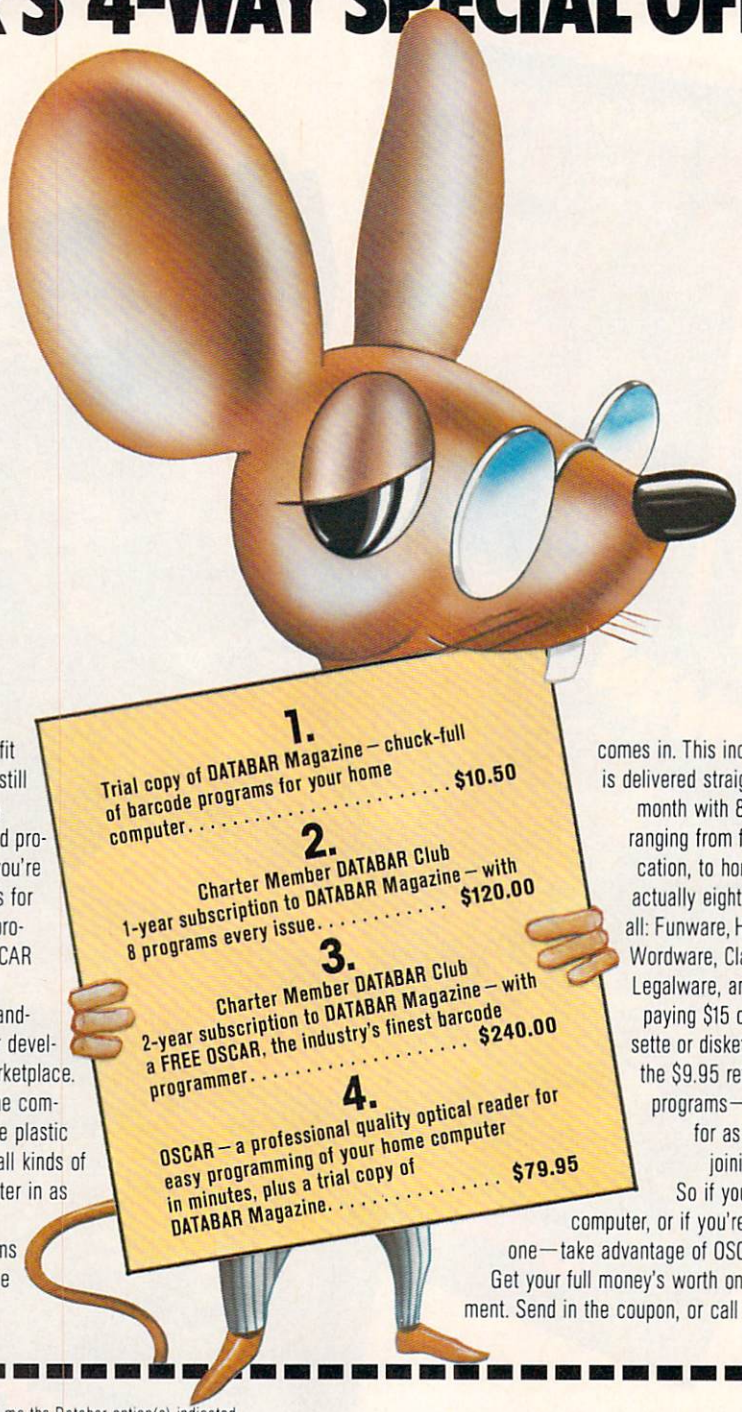
Moon Shuttle® is a registered trademark of Nichibutsu, USA.

GENESIS™ and Design Labs are trademarks of Design Labs.

© 1983 DATASOFT INC.

9421 Winnetka Avenue, Chatsworth, CA 91311 (213) 701-5161

OSCAR'S 4-WAY SPECIAL OFFER!



1.
Trial copy of DATABAR Magazine – chuck-full of barcode programs for your home computer. $10.50

2.
Charter Member DATABAR Club
1-year subscription to DATABAR Magazine – with 8 programs every issue. $120.00

3.
Charter Member DATABAR Club
2-year subscription to DATABAR Magazine – with a FREE OSCAR, the industry's finest barcode programmer. $240.00

4.
OSCAR – a professional quality optical reader for easy programming of your home computer in minutes, plus a trial copy of DATABAR Magazine. $79.95

If you want to get more benefit out of your home computer and still avoid the purchase of expensive peripherals...if complex keyboard programming leaves you cold and you're tired of paying exhorbitant prices for every new cassette or diskette program—then you're ready for OSCAR and the DATABAR Club!

OSCAR is simply the finest hand-held optical barcode reader ever developed for the home computer marketplace. It works with virtually every home computer. And together with a simple plastic template, it allows you to enter all kinds of programs into your home computer in as little as two minutes.

But hardware without programs is useless—and that's where the DATABAR Club comes in. This includes a magazine that is delivered straight to your home every month with 8 programs on subjects ranging from fun and games, to education, to home finances. There are actually eight different categories in all: Funware, Homeware, Healthware, Wordware, Classware, Scienceware, Legalware, and Genware. Instead of paying $15 or $30 or more for cassette or diskette programs, or paying the $9.95 retail price for DATABAR programs—you can receive them for as little as $1.25 each by joining the DATABAR Club.

So if you already have a home computer, or if you're thinking about buying one—take advantage of OSCAR's 4-way offer now. Get your full money's worth on your computer investment. Send in the coupon, or call for further information.

Please send me the Databar option(s) indicated.
☐ Option 1 ($10.50) ☐ Option 3 ($240.00)
☐ Option 2 ($120.00) ☐ Option 4 ($79.95)*
*30-day money-back guarantee

Enclosed Check # _____

Money Order # _____
Payable to Databar.

Or charge my Am Ex ☐ Visa ☐
MasterCard ☐ Diners Club ☐
Carte Blanche ☐

Card # _____

Exp. Date _____

Name _____

Address _____

City _____ State _____ Zip _____

My Computer Model is _____

DATABAR

Databar Corporation, 10202 Crosstown Circle • Eden Prairie, MN 55344 • Phone Orders: MN (612) 944-5700
Out-of-State: 1 (800) 672-2776

Circle No. 202

TURN YOUR COMPUTER INTO A FULL-BLOODED WORD PROCESSOR.

VIC 20™ and Commodore 64™ users, something very clever is lying in wait for you. It's called Quick Brown Fox.™

Quite simply, Quick Brown Fox is the quickest, easiest to learn, user-friendliest—and most versatile—word processing software running.

Take a look at some of these crafty features. You get full editing, even on standard displays. (The Fox supports most 80-column boards too.) You get automatic reformatting of edited text, not the tedious paragraph-by-paragraph runaround. There's more. You get single-key operation, text moving, boilerplating, tab and margin settings, right justification, proportional spacing. You get intelligent software that uses less computer memory. (That's how come it even works with an off-the-shelf VIC 20.) You also get compatibility with a wide range of printers—plus plenty more.

And you get it all for only $65. Doesn't that make you want to trot through your texts with a Quick Brown Fox?

QUICK BROWN FOX™

Call or write for more details:
536 Broadway, 11th Floor, New York, New York 10012 (212) 925-8290
Dealer Inquiries Invited

Circle No. 142

OFFICIALLY APPROVED BY COMMODORE

© 1983 Quick Brown Fox

Award-Winning Hits for your Commodore

CHOPLIFTER*
For the Commodore VIC-20.

Those are our men they're holding hostage! We don't care how you do it, but you've got to shoot your way in there and bring 'em back alive. You've got three choppers, probably not enough but it's all we can spare. And the enemy camp is pretty heavily fortified. With tanks, jetfighters and truly nasty laser bombs. Okay, maybe it's a suicide mission, but somebody's got to do it. Dozens of innocent lives are at stake. We're counting on you... don't let them down!

Now you can play some of America's hottest computer games on your Commodore, and get a FREE introduction to Home Management Software. It's our way of showing you that action-packed gaming is only the beginning of your Commodore's capabilities.

C R E A T I V E

*SELECTED AS SOME OF THE "MOST INNOVATIVE COMPUTER PROGRAMS" 1983 CES SOFTWARE SHOWCASE AWARDS.

with a Free Software Bonus.

SERPENTINE*
For the Commodore VIC-20.

In the Kingdom of Serpents, the only rule is eat or be eaten. Three huge and evil red snakes are slithering through a complex series of mazes, closing in on your good blue serpent from all sides. Move fast and watch your tail! Try to survive long enough to let your eggs hatch into reinforcements. Swallow the magical frogs or your enemy's eggs and you can get the strength to go on... but look out to your left... and ahead of you! They've got you surrounded, and it looks like meal time.

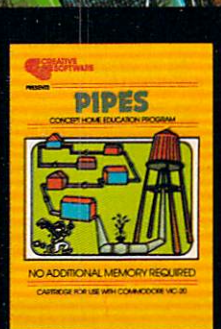
It can teach you. Manage your family finances. Even help you buy a new car. And now, for a limited time only, when you buy one of our specially-marked games you'll receive a certificate good for one of our Home Management Programs absolutely free.

S O F T W A R E

"CHOPLIFTER" AND "SERPENTINE" ARE VIC-20 TRANSLATIONS OF ORIGINALS BY DAN GORLIN AND DAVID SNIDER, RESPECTIVELY.

"CHOPLIFTER" AND "SERPENTINE" ARE LICENSED FROM BRODERBUND SOFTWARE, INC.

Get more out of your Commodore.



PIPES*
For the VIC-20 and Commodore 64.

Arlo is a hard-working plumber, but a touch absent-minded. He's building a water supply system for the whole neighborhood, and he really has his hands full. Help Arlo decide what kind of pipe to buy and where to put it...his limited budget doesn't leave him much margin for error. Figure out the shortest, most economical way to get everyone hooked up...and just hope poor Arlo has remembered to open and close the right valves. A marvelously entertaining and challenging exercise in planning, economics and spatial relationships for all ages.

1983 AWARD WINNER ★★★★

Look for complete promotional details inside each specially-marked box of our year's biggest hits. Or talk to your Creative Software dealer. See how creative your Commodore really can be!

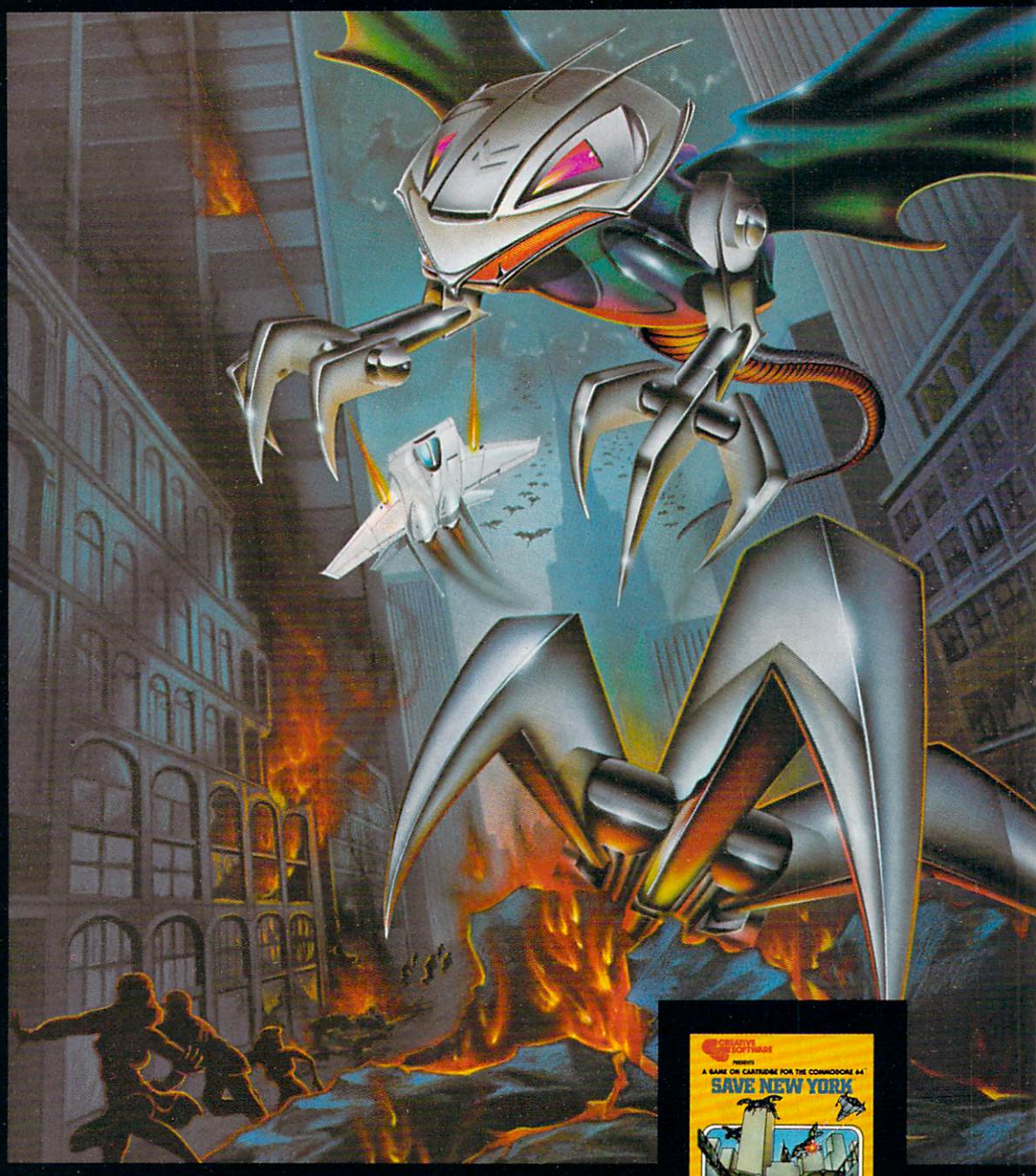
C R E A T I V E

*SELECTED AS SOME OF THE "MOST INNOVATIVE COMPUTER PROGRAMS" 1983 CES SOFTWARE SHOWCASE AWARDS.

Get Creative!

SAVE NEW YORK™
For the Commodore 64.

It was as peaceful a day as New York ever gets, when suddenly the sky went dark and a monstrous droning noise filled the air. Hordes of grotesque aliens were swooping down from all sides, biting into the Big Apple as if they hadn't eaten for days. They were laying eggs, too. Horrible slimy things that got down into the subway tunnels and began clawing their way up. If anyone was going to save the city, it would have to be me. I leapt into my rocket and began blasting away. I thought I stood a fighting chance, but fuel's running low. . . another wave of invaders on the horizon . . . signing off . . .



S O F T W A R E

"VIC-20" AND "COMMODORE 64" ARE TRADEMARKS OF COMMODORE ELECTRONICS, LTD.

© 1983 CREATIVE SOFTWARE

Living With . . .

1984

By Colin F. Thompson

1984. George Orwell was wrong. His chilling 1950's view of our present year did not materialize. Perhaps his speculations on the totally controlled society actually prevented Big Brother's birth. I hope so.

1984. George Orwell was right. The citizens of our planet have never been closer, more in touch and aware of each other's problems and triumphs. Part of Orwell's vision has born true–the computer. In the last 30 years digital technology has shrunk our world in a way that political and religious philosophies have not been able to do in thousands of years. This new awareness is due directly to the application of computer technology to every level of our lives. Big Brother turned out to be beneficial, not smothering.

1984. Big Brother turned out to be Little Brother. Anyone with about $75 can own a Little Brother. 1983 saw the VIC come of age. Three years after its birth it blossomed and immediately began the rapid descent into obsolescence. VIC is being dragged from its pedestal by its own offspring, the Commodore 64.

1984 will be the year of the C-64. Many top level Commodore programmers have turned their attention from the VIC to the high resolution, musical genius of the C-64. As a VIC software reviewer, my future in these pages has come full circle. At first there was little to write about, then too much to write about, and now almost nothing. Change is inevitable, so change I must.

1984. Do I adore my 64? Not really, but perhaps that will change also. I'm hoping that a few software authors out there will dazzle me with programs that will make my life easier. When that happens, I will report the results in this column.

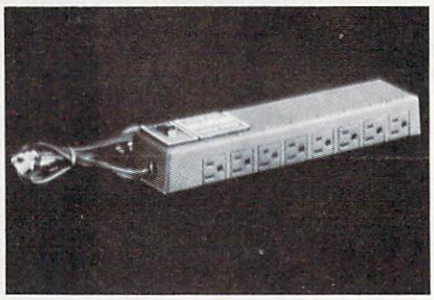
1984. It will be a year of change and growth in the Commodore community. The long awaited model 128 should rear it's business-like head and roar. I will acquire one of these machines when they become available and review the best products made for it. If Commodore rolls out a lap-sized computer like the Radio Shack 100, I will get one and wring it out.

1984. I'm excited by the changes. The world of microcomputing is running wild and I'm happily giving chase. When I reflect on the past year, my most vivid memories are not of technology, but of the human experience. I have made many new friends through this column. My thanks go out to all of you who have taken the time to put your thoughts on paper and send them to me. I sense your excitement and gather energy from it. Your letters keep my direction on target.

NEW BUSINESS IN THE NEW YEAR

I live within walking distance of three Radio Shack stores. Although I've resisted the temptation of buying a TRS-80 Model "Anything", I find myself brousing their shelves in search of something that might enhance my many Commodore computers. Last month I hit the jackpot. I'd been searching high and low for a six outlet, switched, filtered power strip. The power strip of my dreams would have each outlet isolated from the rest. I needed this strip for three reasons. My Smith-Corona TP-1 has a nasty habit of resetting the computer when I turn on the TP-1. Power line spikes cause the problem. My two Commodore disk drives cause the same problem. When one is turned on, the other one locks up. (The MSD drive does not seem to be affected). And finally, I wanted to be able to turn on and off the entire system with one switch.

Several months ago I bought a Panamax 6 outlet line filter but found it did not solve my problem. The six outlets were isolated and filtered against any interference from the AC Line but not from each other. The Radio Shack line filter meets all my stringent requirements.



There are eight outlets on the back of the unit, with the master power switch on the top. This is a great arrangement. It lets me put the filter under my monitor, with the various line cords snaking in from the rear of the desk. The switch is very easy to reach. Best of all, each outlet is isolated from the rest. The TP-1 has been rendered harmless, and the maze of power cords has been brought under control. I couldn't be happier. The Radio Shack Part Number is 26-1451 and it costs only $50.00

Continued on page 19

If you're all thumbs at the keyboard, MasterType™ will make you a computer whiz.

MasterType #1 on everybody's list... the first step in computer literacy.

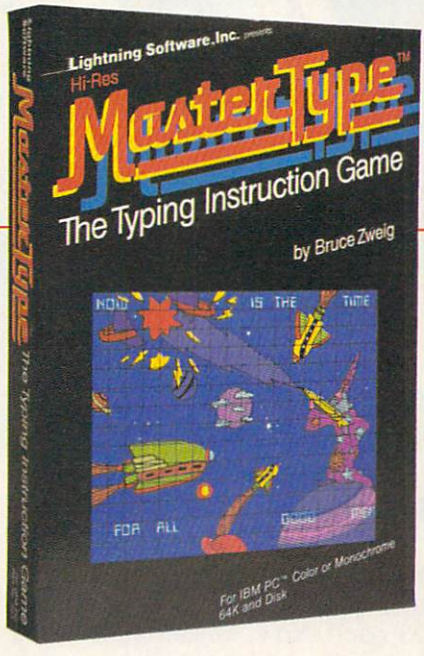
MasterType delivers. It is the one and only typing program that dares to be fun without being intimidating. It combines the fast action of video games with the best typing skills development techniques available. The result? Highly motivated and enjoyable learning.

After each of the 18 action-packed program segments, you'll see how you measure up. And you'll become so caught up in the action that before you know it, you'll become a master at the keyboard, calling all the shots.

On disks for
Apple®, Atari®, Commodore 64® $39.95
IBM-PC® $49.95

MasterType is part of the growing Scarborough family, which includes Songwriter and Picture-Writer, as well as the forthcoming software for home management, science and business games.

New
Atari® and Commodore 64® cartridges.



The Scarborough System.

You'll grow with us.

© Scarborough Systems, Inc., 25 N. Broadway, Tarrytown, N.Y. 10591

Circle No. 221

Info Designs slashes the cost of small business accounting for the Commodore-64

Now only $79.95

The power of Info Designs Management Accounting System is available on the Commodore-64 in a full and faithful version!

Thousands of these quality business accounting software packages have been sold on the CBM computer at $595 each. Now, similar features are available to the small business user on the Commodore-64 for $79.95 per module!

Select the accounting modules you need—

- Accounts Receivable/Billing
- Accounts Payable/Checkwriting
- General Ledger
- Inventory Management
- Payroll

Our SoftPack combination contains the "Big-3" accounting—A/R, A/P and G/L—for only $239.85 Available for immediate delivery!

Flexible Design

The accounting system will work with one or two VIC-1541 disk drives (or 2031/4040 with IEEE interface), 1525 printer, and color or b&w monitor or TV.

Customer Support Plan

As part of Info Designs ongoing effort to provide the highest quality microcomputer applications in the marketplace, we offer an optional telephone consulting service to support installation and ongoing operations.

Order NOW...for immediate delivery

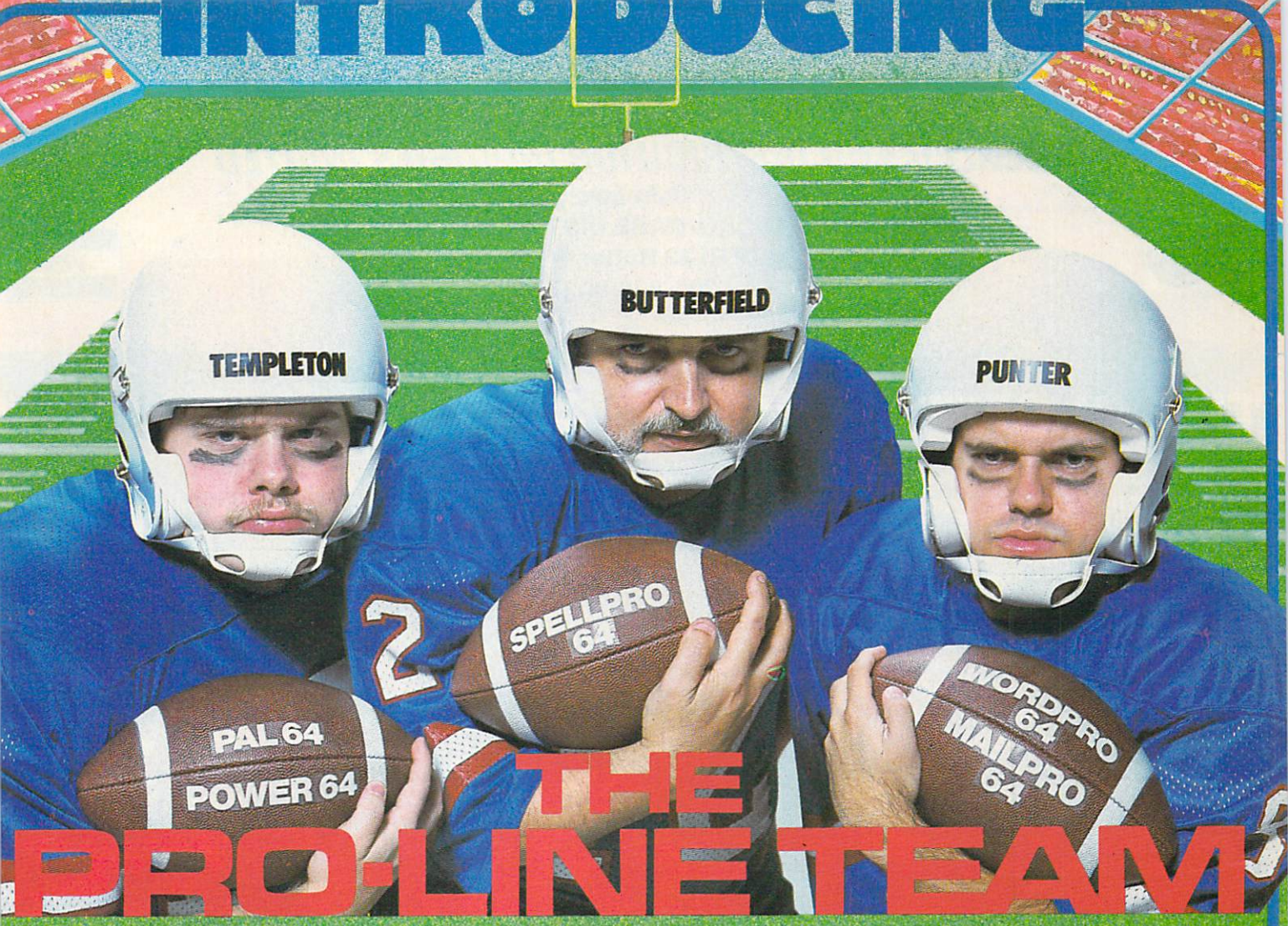
See you local Commodore-64 Dealer or call us directly at **(313) 540-4010.** MasterCard and Visa accepted.

Info Designs

6905 Telegraph Road • Birmingham, MI 48010 • (313) 540-4010

Circle No. 52

INTRODUCING



THE PRO-LINE TEAM

PAL 64
The fastest and easiest to use assembler for the Commodore 64.+ Pal 64 enables the user to perform assembly language programming using the standard MOS mnemonics. **$49.95***

POWER 64
Is an absolutely indispensible aid to the programmer using Commodore 64 BASIC. Power 64 turbo-charges resident BASIC with dozens of new super useful commands like MERGE, UNDO, TEST and DISK as well as all the old standbys such as RENUM and SEARCH & REPLACE. Includes MorePower 64. **$49.95***

TOOL BOX 64
Is the ultimate programmer's utility package. Includes Pal 64 assembler and Power 64 BASIC soup-up kit all together in one fully integrated and economical package. **$89.95***

SPELLPRO 64
Is an easy to use spelling checker with a standard dictionary expandable to 80,000 words. SpellPro 64 quickly adapts itself to your personal vocabulary and business jargon allowing you to add and delete words to/from the dictionary, edit documents to correct unrecognized words and output lists of unrecognized words to printer or screen. SpellPro 64 was designed to work with the WordPro Series and other wordprocessing programs using the WordPro file format. **$49.95***

MAILPRO, SPELLPRO and PAL are available for Commodore 8032 computers equipped with either Commodore 4040 or 8050 Disk Drives. Further information on request.

Distributed in Canada by:
PACO ELECTRONICS LTD.
20 Steelcase Rd., West, Unit 10
Markham, Ont., L3R 1B2
416-475-0740 Telex 06-966655

U.S. Dealer, Distributer inquiries invited.

*Prices shown are in U.S. Dollars, slightly higher in Canada

+Commodore 64 and Commodore are trademarks of Commodore Business Machines Inc.

WORDPRO 64
This brand new offering from the originators of the WordPro Series brings professional wordprocessing to the Commodore 64 for the first time. Two years under development, WordPro 64 features 100% proportional printing capability as well as 40/80 column display, automatic word wrap, columnization, alternate paging for headers & footers, four way scrolling, extra text area and a brand new 'OOPS' buffer that magically brings back text deleted in error. All you ever dreamed of in a wordprocessor program, WordPro 64 sets a new high standard for the software industry to meet. **$49.95***

MAILPRO 64
A new generation of data organizer and list manager, MailPro 64 is the easiest of all to learn and use. Handles up to 2,000 records on one disk, prints multiple labels across, does minor text editing ie: setting up invoices. Best of all, MailPro 64 resides entirely within memory so you don't have to constantly juggle disks like you must with other data base managers for the Commodore 64. **$49.95***

Circle No. 76

PRO·LINE SOFTWARE
(416) 273-6350

WE'LL BACK YOU UP!

"The best back-up and disk utilities to date."

DEALER AND DISTRIBUTOR INQUIRIES INVITED

Order from

MICRO-WARE DIST. INC.
1342B Rt 23 Butler, NJ 07405
201-838-9027

MasterCard VISA

THE CLONE MACHINE™ *FROM MICRO-WARE DIST. INC.*

Take control of your 1541 disk drive with this indispensible disk users tool. The Clone Machine will allow you to copy programs, files, full or partial disks, and even allow track/block editing. Package includes:

1) Complete and thorough users manual
2) Copy with one or two drives
3) Copy all file types including relative files
4) Investigate and back-up many protected disks.
5) View track/block in HEX or ASCII
6) Easily edit track blocks
7) Display full contents of directory and print
8) Change program names, add, delete files with simple keystroke
9) Easy disk intitialization
10) Supports up to four drives

All this for only $49.95

Special limited introductory offer
$39.95

Commodore® 64 OWNERS

APPLE II, FRANKLIN & APPLE IIe OWNERS

The NEW REVISED Nibbles Away II™

version C by COMPUTERapplications

1) Full Apple IIe compatibility
2) New auto-loading to simplify parameter access
3) Added printer compatibility
4) Enhanced printing formats
5) CTRL P screen snapshot to printer
6) Enhanced sector editing
7) New disk data search & full disk diagnostics
8) Subscription to NIBBLE NEWS Available for back up hints and new parameter settings.

NIBBLES AWAY II version C is still the best and most supported back up program available. Written about in the New York Times Business Section, Science 83, Digital retailing, and other publications as one of the most popular of its kind. A necessary program for all Apple & Franklin owners. List $69.95

Limited special offer only $64.95

Circle No. 55

Continued from page 14

MEAN GREEN VIEW SCREEN

While we are on the subject of non-Commodore products, I should mention my NEC video monitor. Why do I use a green screen monitor on my colorful VIC and 64? Only one reason, really–so I can see 80 columns. The Data-20 Display Manager puts 80 columns of data on the screen. This is the best way to process words. I use it with Quick Brown Fox for all my writing. The word processing program that comes with the Display Manager–Word Manager–also uses the 80 column format. WM is a very nice package. Its strength is in its simplicity. However, to use either word processor, you will need a high resolution monochrome (one color) monitor. Neither the Commodore 1701 color monitor nor a TV set will display 80 columns clearly enough to use.

Fortunately for us, there are many low cost monochrome monitors on the market. They display a full 80 columns with vivid clarity in either green or amber letters. I won't dredge up the old argument of green versus amber. I picked green simply because it was about half the cost of amber. The NEC Display Monitor, model JB1260M(A), cost me an even $100 over the counter.

The NEC has a 12-inch screen. This yields a usable viewing area about 7″ wide and 5″ high. For me, this is a big improvement on the 9-inch PET monitor. 80 columns printed on this 12″ screen are clear, sharp and highly contrasted. The letters are green (of course) and the background and border are solid black. The unit is light weight (6.5kg), and has a built in carrying handle. An RCA jack in the rear is used to connect the monitor to the computer through an appropriate cable (not included). Like most monitors, it doesn't have an audio circuit. The on/off switch and brightness controls are located on the front panel for easy adjustment. Adjustment knobs for contrast, vertical hold and horizontal hold are in the rear.

ONLY ONE COLOR?

The VIC's normal video output is in vivid color. The NEC displays the colors in various shades of green. I think the best looking color screen is achieved by poking the screen to white and the characters to black.

The NEC really enhanced the video appearance of my C-64. At a very small cost (14 of 16 colors are missing) the normally illegible screen on my 64 is now legible. All the characters are clearly represented, not just every other one, as before on the 1701. I'm pleased with the performance of the monitor. You may contact the manufacturer at 1401 Estes Avenue, Elk Grove Village, IL 60007.

vicCOMM

Another "newsletter sized" publication, chock full of VIC and C-64 information, is being published in North Carolina. Editor Ed Cox has put out the first three bi-monthly issues and is now working on the fourth. I've read all the issues and believe the bulk of the articles are aimed at the user who has a fair grasp of BASIC and is looking for projects to stretch himself. vicCOMM has already covered graphics, word processing, videotext, amateur radio, and slow scan TV for the VIC and 64. I rate the contents equal in quality with the twice-a-month Journal/20. vicCOMM is $9 a year, and is available on tape or disk for $36 and $48 respectively. Box 5491, Duke Station, Durham, NC 22706.

QUEUED UP

Next month's menu includes an in-depth look at the DYNAX DX-15 letter quality printer and two disk copy utilities–one for the VIC and one for the C-64. Perhaps in a month I will have thought up a new name for the column. Your suggestions are welcome. Happy New Year!

NEVER UNDERSOLD
—Leader Since 1980—
COMPUSETTE.
at
Manufacturer Prices
Industries Finest

AGFA PE 611

	Retail	Your Cost
C-05	99¢	55¢
C-10	$1.29	59¢
C-20	$1.59	69¢
C-30	$1.89	89¢
Cases	49¢	21¢

Circle No. 224
Packed 24 Per Pack
UPS $3.00 Per Pack 48 States
Micro-80™ INC.
2665 Busby Vista Road
Oak Harbor, WA 98277
IMMEDIATE SHIPPING
(206) 675-6143

MicroClear

QUALITY SOFTWARE FOR YOUR C 64 - VIC 20

HOME LIBRARIAN
Random access electronic card catalogue for book and magazine lovers. Contains 15 fields for data entry — author, title, 4 subject fields + more. 5 level search, 2 level sort, 2 wildcards. Selective/random record review. Report generator creates user defined hard copy. 100% machine language.
C 64 or VIC 20 Disk only $29.95

THESIS MASTER
Organizes research notes and creates bibliography. 6 level search, 2 level sort, 2 wildcards. Huge multiscreen text area. Report generator creates user defined hard copy. 100% machine language.
C 64 Disk only $29.95

STAMP COLLECTOR
Put your entire collection at your finger tips. Multifeatured program includes edit, report and file backup features. For the beginner and expert alike.
C 64 or VIC 20 Tape or disk $29.95

All VIC 20 programs require 8K min. expansion. Specify VIC or C 64, tape or disk. Send check or money order + $2.00 S/H. Missouri residents add 5⅝% sales tax.
Circle No. 226
MicroClear
P.O. Box 9368
Raytown, MO 64133
Dealer inquiries invited

COMMAND POST

By Jim Grubbs

The computer revolution continues as 1984 dawns bright. To those of you joining us for the first time, a hearty welcome! A "Little Bird" tells me that most of our new readers are sporting C-64 computers, and most of you have bought disk drives to go with them. This certainly has implications for the future, but be assured that we have plenty of room to accomodate both the VIC and the 64 in our discussions.

With the joys of the holiday season recently past, let us continue taking a look at some accessories to help you get the most out of your machine in the ham shack.

WHERE NO ONE HAS GONE BEFORE

The Kantronics interface was one of the first amateur radio-to-computer interfaces available. Consequently many of them have found their way into the homes of active radio and computer enthusiasts. Of course a good many people purchase the Kantronics Interface when they buy their software, but a surprisingly large number of them have been purchased separately by those of us more inclined toward programming than hardware.

Making the first anything is a tough job. You're not entirely sure what the marketplace is looking for. You don't really know what the competition will be like. You don't really know what people are willing to spend. So you take your best shot at what you think makes the most business sense. It would appear that is exactly what Kantronics did with their original interface.

The Interface does an adequate job for amateur applications. Although I was somewhat surprised by the small size of the unit, it was a welcome surprise since my hamshack always seems to look like it is about to burst through the walls at any moment. Don't let the size fool you though, it is a good performer.

It seems the general practice these days not to include a power source with equipment. I suppose it does keep costs down, and allows those of us who power everything off of one big 12-volt supply not to have a bunch of extra power packs around. Anyway, you need a separate source of power for the Interface, as none is provided.

I found the unit to be of top-notch construction, a glass epoxy board and good clean wiring. Operationally it uses active filters to lock onto the CW or RTTY tone. Notice the singular, particularly for RTTY. This interface decodes RTTY and ASCII (both use the same keying method) by copying only one of the two tones present. If you are not familiar with frequency shift keying demodulation, suffice it to say that a mark and a space tone are rapidly shifted. Many inexpensive terminal units make use of only one of these tones. The Interface is in this category. Lest this appear all bad, there are proponents of the single tone system who maintain that phase differences when using both tones cause more problems than they cure. I am not one of these proponents. I have used everything from a homebrew 567 PLL decoder to some of the more sophisticated HAL demodulators and I have always found the dual tone demodulation technique to work better.

I was pleasantly surprised at the performance of the Interface. It copied signals that sounded like they were too weak to produce good copy. It did have a problem dealing with interference though.

There is a switch located on the front of the unit to flip from CW to RTTY reception. All this switch does is move the center frequency of the filters from 2295 hertz for RTTY down to 750 hertz for CW. I found that with my particular transceiver (an FT-101) even the RTTY copied better in the CW position. Many SSB filters start to cut off just about two kilohertz and will not reliably pass the normal RTTY tones. Others report similar problems. Not everyone owns either a very new or very old receiver with special provisions for shifting the bandpass of the filters.

When I tried the Interface on some commercial teletype transmissions (many are 67 wpm, 425 hertz shift) I had a great deal of difficulty in tuning the signal to get any kind of reliable copy at all. Keep in mind though that the Interface is designed only for 170 hertz shift as normally used on the high frequency amateur bands. It does not claim to be designed for use in copying commercial stations.

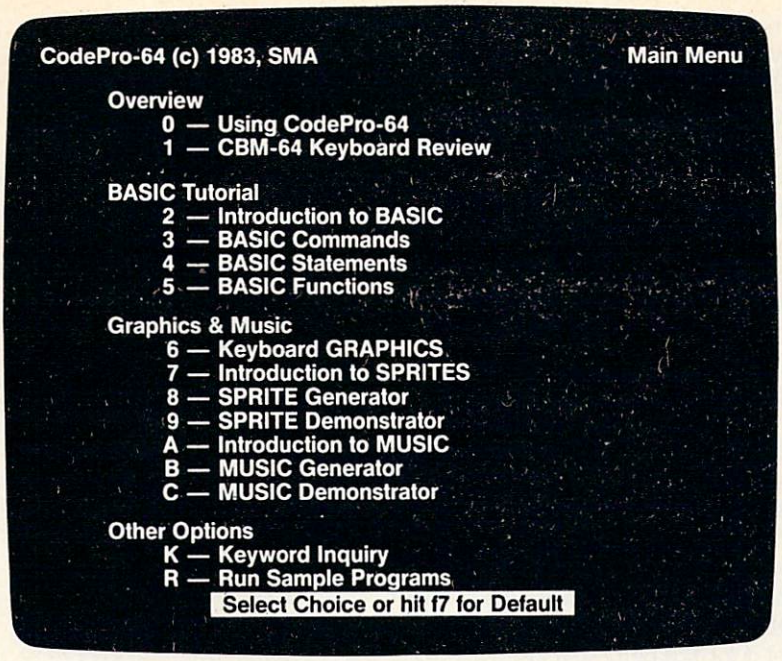
On transmit, only 170 hertz tones are generated, 850 hertz shift is not available.

I did find the bar graph tuning aid, along with another single LED, to do a good job in helping me tune signals. If you are trying to copy signals with inverted shift (mark and space tones reversed) there is no provision on the unit to accomplish this. With the Hamsoft or Hamtext package this can be accomplished by software options.

The instructions included were very thorough. At approximately $150, the Interface does a good job at what it claims to do.

A PATCH FOR YOUR COMPUTER

Not only do the folks at AEA sell an excellent software package in the AEA-



NEW! For the Commodore 64™

ANNOUNCING

CodePro-64™

A new concept in interactive visual learning . . .

Now you can learn to code in BASIC and develop advanced programming skills with graphics, sprites and music—**visually.** You learn by interacting with CodePro-64, a new concept in interactive visual learning.

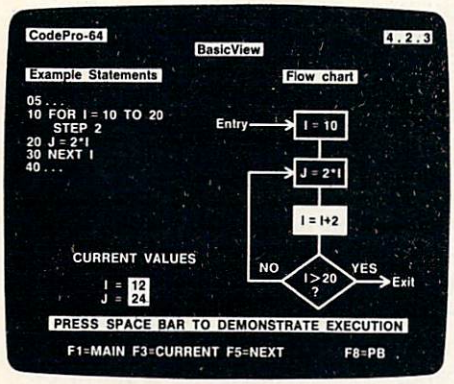
SEE PROGRAM EXECUTION

Imagine actually seeing BASIC statements execute. CodePro-64 guides you through structured examples of BASIC program segments. You enter the requested data or let CodePro-64 do the typing for you. (It will not let you make a mistake.)

After entering an example you invoke our exclusive **BasicView™** which **shows you how the BASIC program example executes.**

You step through and actually see the execution of sample program statements by simply pressing the space bar. CodePro-64 does the rest.

You see statements with corresponding **flow chart graphics** and variable value displays. You learn by visual examples.



EXTENSIVE TUTORIAL

CodePro-64's extensive tutorial guides you through each BASIC command, program statement, and function. You get clear explanations. Then you enter program statements as interactive examples. Where appropriate, you invoke BasicView to see examples execute and watch their flow charts and variables change.

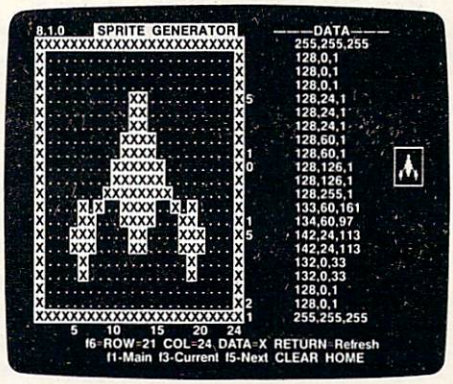
By seeing graphic displays of program segment execution you learn by visual example. You **learn faster and grasp programming concepts easier** with CodePro-64 because you immediately see the results of your input.

You control your learning. You can go through the tutorial sequentially, or return to the main menu and select different topics, or **use keywords** to select language elements to study. You can page back and forth between screens within a topic at the touch of a function key.

CodePro-64 **lets you follow your interests** and practice with interactive examples. But you can never get "lost". F1 will always return you to the main menu. Once you have practiced and mastered the BASIC language elements you move on to more advanced concepts. You learn about sprite and music programming.

SPRITE GENERATOR & DEMONSTRATOR

CodePro-64's sprite generator lets you **define your own sprites** on the screen. You learn how to define sprites and what data values correspond to your sprite definitions. (You can then use these values to write your own programs.) You can **easily experiment** with different definitions and make changes to immediately see the effects.



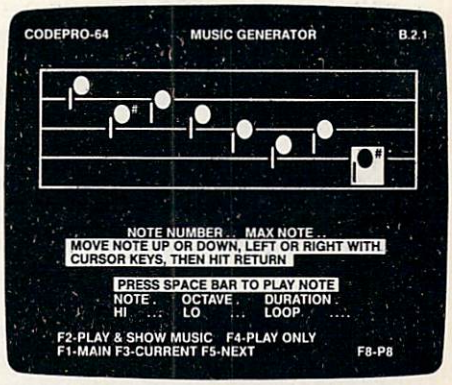
We also help you learn to program with sprites by giving you a **sprite demonstrator** so you can see the effect of changing register values. You can experiment by moving your sprite around in a screen segment, change its color or priority, and see the effects of your changes. You learn by visual examples.

MUSIC GENERATOR & DEMONSTRATOR

To teach you music programming CodePro-64 gives you an interactive music generator and demonstrator. First we help you set all your SID parameters (attack/decay, sustain/release, waveform, etc.). Then you enter notes to play and **we show your tune graphically as it plays,** note by note, on the scale. You learn by seeing and hearing the results of your input.

OUR GUARANTEE

We guarantee your satisfaction. You must be satisfied with CodePro-64 for the Commodore-64. Try it for 10 days and if for any reason you are not satisfied return it to us (undamaged) for a full refund. **No risk.**


CODEPRO-64
MUSIC GENERATOR
B.2.1
NOTE NUMBER . . MAX NOTE . .
MOVE NOTE UP OR DOWN, LEFT OR RIGHT WITH
CURSOR KEYS, THEN HIT RETURN
PRESS SPACE BAR TO PLAY NOTE
NOTE . OCTAVE . DURATION .
HI . . . LO . . . LOOP . . . .
F2-PLAY & SHOW MUSIC F4-PLAY ONLY
F1-MAIN F3-CURRENT F5-NEXT
F8-P8

Our music demonstrator **lets you experiment** with various combinations of music programming parameters and hear the results. You can **quickly modify any of the SID register values** to hear the effects of the change. For example, you could easily change waveform and attack/decay values while holding all other SID values constant. By seeing your input and hearing the result you quickly learn how to create new musical sounds and special sound effects.

AND MORE . . .

We don't have enough space to tell you everything CodePro-64 offers. You need to see for yourself. BASIC tutorials, graphics, sprites, music, keyboard review, sample programs—the main menu shown above gives you just a summary of the contents of this powerful educational product.

Whether you're a beginning programmer or an experienced professional, CodePro-64 will help you improve your Commodore 64 programming skills. We're sure because CodePro-64 was developed by a team of two professionals with **over 25 years** of software development experience.

CodePro-64 is a professional quality educational program for the serious student of personal computing. And it's **fully guaranteed.** Order yours today.

HOW TO ORDER

Order your copy of CodePro-64 today by mail or phone. Send only $59.95 plus $3.00 shipping and handling to:

SYSTEMS MANAGEMENT ASSOCIATES
3700 Computer Drive, Dept. CM
Raleigh, N. C. 27609

Available on **diskette only.** MasterCard/VISA accepted. For faster service on credit card orders call toll free **1-800-SMA-RUSH** (1-800-762-7874).

Commodore 64 is a trademark of Commodore Business Machines, Inc.

Ad no. 733, Copyright 1983, SMA

Dealer inquiries invited.

MBATEXT, they have an excellent computer terminal unit in their Computer Patch, or CP-1.

The CP-1 follows the tradition of excellence in products associated with the AEA name. They have been making code and RTTY readers for some time. They have employed this knowledge with good results in the CP-1.

The AEA CP-1 "Computer Patch"

This excellence shows in the superior construction techniques and the just plain good looks of the CP-1. It also requires an external power source, but the adapter is provided.

Like the Kantronics unit, the AEA filters are tuned to a lower frequency for CW. On RTTY the 170 hertz shift position is switch selectable. You are not limited to only this shift however. Included is a variable shift position that will cover everything up to approximately 1000 hertz. My experience with this option showed it to be an improvement over the original Kantronics unit when copying commercial stations. I did find it somewhat difficult to determine the best setting for other than 170 hertz shift. The transmit side provides only 170 hertz tones, so that will be a problem for the VHFers.

Scope outputs are available so that a real RTTY tuning scope can be used if you have one. Over the years I have used a scope and found that it's a bit like having a cruise control on your car–very nice to have, but far from a necessity.

The adjacent signal rejection is truly impressive using the CP-1. Numerous times I would carefully tune (I thought) to the stronger of two signals very close together and get perfect copy. I became truly impressed when the stronger signal disappeared and I found that I was actually tuned to the much weaker signal and getting perfect copy.

With the dual tone detection and variable shift features of the CP-1, I found that I got very good copy on all modes, including commercial "press" transmissions. Hook one of these up and you can show the kids what the US Information Service 100 wpm French newswire looks like, or get around the world weather data from one of several stations!

The CP-1 has excellent documentation and comes with a ninety day warranty. It is priced at $239, but is being offered at special savings if bought in a package with the MBATEXT software. It's a hard combination to beat.

SON OF INTERFACE

One of the nice things about a good company is that they listen to their customers. Kantronics has gotten a lot of feedback from owners of the original Interface, and they have incorporated virtually all of them into a new super interface, the Interface II. The unit has just begun production as I write this, so a hands on test was not possible.

Kantronics has joined AEA in providing a true dual tone RTTY receive system. Secondly, switch selectable 170, 425, and 850 hertz shifts are available. There's no guessing with this one! On the amateur bands you set it for 170 hertz shift just as before and forget it. On the commercial bands, 425 is the usual rule (the Navy still likes to use 850, but most of their transmissions are encrypted anyway). For the VHF operator 850 hertz is available. This shift is also available on transmit, a feature not found on other units.

The Kantronics folks have gone the extra mile in providing dual hook ups on the back side. You don't have to rearrange the shack to switch from the low bands to VHF. Separate connections are provided for two transceivers, a very nice touch.

There are scope outputs and a much improved tuning indicator. Suggested price for the Interface II is $259. I'll let you know how it performs in a future issue.

STUFFING YOUR OWN STOCKING

If you were fortunate enough to get everything you wanted for Christmas, like a new computer, one of the excellent software packages we reviewed and a top notch interface, I still have a suggestion to make. One of the most interesting things to me about having an RTTY terminal available is printing the commercial frequencies. So many of the transmissions are at "odd" speeds and shifts that it can be very frustrating trying to tune the signal. Since many of these services are in languages other than English, this makes things even more difficult.

I've discovered at least one solution to many of these problems in a book titled, "Guide to RTTY Frequencies", by Oliver P. Ferrell. If the name rings a bell, Mr. Ferrell was the editor of Popular Electronics in its heyday. He is now Chief Executive Office of Gilfer Associates. This guide includes an excellent introduction to tuning the commercial bands. The main course consists of two lists, one by frequency and another by call sign, listing many teletype services from around the world. It's always difficult to keep the accuracy high in such a publication, but my own experience showed this one to be right on the mark (and space!) most of the time. I highly recommend it as an operating accessory. Reading Perry's introduction took me back to my early days in amateur radio. Does anyone remember the "Adventures of Carl and Jerry"? *Guide to RTTY Frequencies* is available for $9.95 from Gilfer Associates, PO Box 239, 52 Park Avenue, Park Ridge, NJ 07656.

ETCETERA

Kantronics also recently announced a package for the short wave listener (SWL) that will allow your VIC or 64 to be used with your receiver to copy not only CW, RTTY and ASCII, but also will allow you to "break" certain simple encryption techniques! An "on screen" tuning indicator is included to help you measure the timing of signals and then change the baud rate to print non-standard speed signals. RADIOTAP is the name of this package with a suggested price of $199.95.

Have you been looking for a good program to track OSCAR or any satellite for that matter (including the Space Shuttle)? Look no further. Tony Parise, WA3HRL has written AMS-2064 which works on either a VIC or 64. The way he handles formatting it for the right machine is really slick. The program is sold by AMSAT, the Radio Amateur Satellite Corporation, PO Box 27, Washington, DC 20044. The price is $10 for the cassette version, with proceeds going to support the amateur satellite effort.

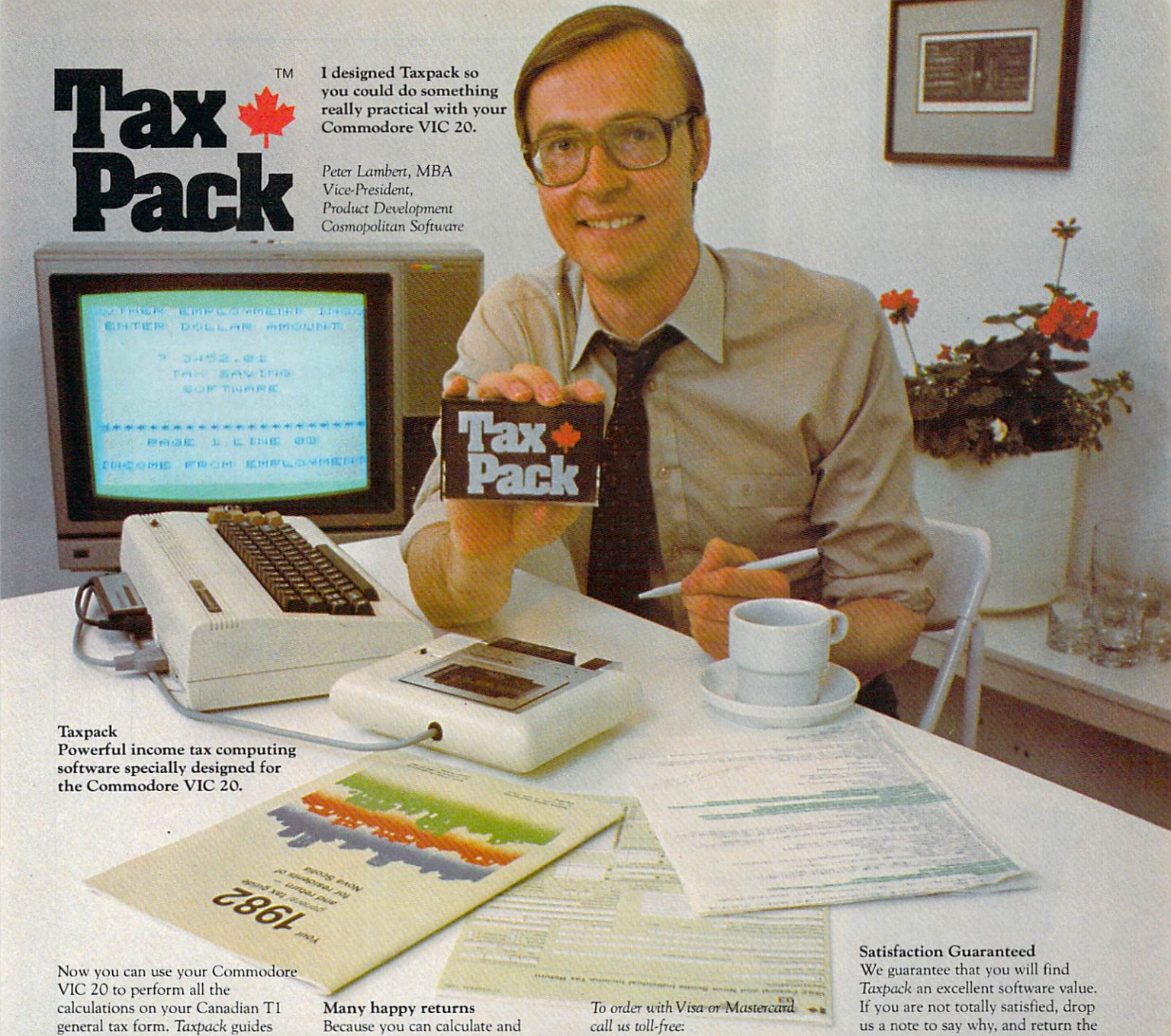
MID-WINTER MADNESS

Winter got you down? No money left for you computer after buying Smurfs and Jedi Knights for the kids? Next time, a cure for the winter doldrums that costs next to nothing, particularly if you own a VIC Modem! You might "eye" the modular cord on your telephone (the one that connects from the base of the phone to the handset) in the meantime. If you think someone may be upset if you cut it in two, you better look for an extra one. 73 for now.

Tax Pack™

I designed Taxpack so you could do something really practical with your Commodore VIC 20.

Peter Lambert, MBA
Vice-President,
Product Development
Cosmopolitan Software



Taxpack
Powerful income tax computing software specially designed for the Commodore VIC 20.

Now you can use your Commodore VIC 20 to perform all the calculations on your Canadian T1 general tax form. *Taxpack* guides you easily through every aspect of the form with friendly prompts and a comprehensive instruction manual. This new software is available on cassette tape and will run on the standard 3.5k memory in your Commodore VIC 20 home computer.*

Taxpack lets you tackle your income tax form at your own pace. A convenient save-and-restore function lets you record and review historical results. Professional editing features assure easy and accurate data entry. *Taxpack* puts the power of tax modelling and planning for subsequent years in your hands, today.

**The cassette also includes an expanded version of Taxpack with enhanced display features, for the Commodore VIC 20's with 8k+ memory expansion.*

Many happy returns

Because you can calculate and preview more tax scenarios with *Taxpack* than you'd have the patience or the time to do manually, this software can help you save tax dollars. Custom-tailored to the Canadian T1 general form, *Taxpack* will be updated every year to reflect changes in the government's income tax regulations. Innovative program design allows us to update *Taxpack* within days of the new T1's availability.

So easy to order

To use your *Visa* or *Mastercard*, phone us toll free; or, send your cheque or money order with the handy mail-order form attached. We'll confirm your order by return mail. Your up-to-date *Taxpack* cassette and manual will be shipped within 15 days of the release of the 1983 T1 general form.

To order with Visa or Mastercard call us toll-free:

1-800-268-6364

(from B.C., call 112-800-268-6364)

Satisfaction Guaranteed

We guarantee that you will find *Taxpack* an excellent software value. If you are not totally satisfied, drop us a note to say why, and return the product post paid to us within 10 days for a full refund of the purchase price.

I Want Taxpack!

Please send me _____ Taxpacks @ $29.95 $_____
Nova Scotia residents only, add 10% Sales Tax +$_____
Add $2 per unit shipping and handling charges +$_____
Total $_____

My Name _____

Address _____

City _____ Province _____

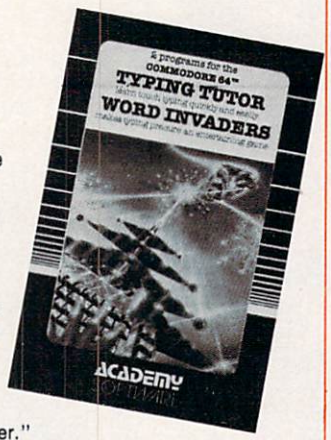
Postal Code _____ Telephone _____

Make Cheque or Money Order payable to:
Cosmopolitan Software Services Limited
and mail with this order form to:
Box 953, Dartmouth, Nova Scotia B2Y 3Z6 Attn: Order Desk

Circle No. 105

VIC 20™
COMMODORE 64™

Still the Best!



Rated **THE BEST** educational program for the VIC 20™ by ***Creative Computing*** magazine.

Commodore 64 version: "This is the best typing tutor we have seen yet; it can get your children touch typing in short order and bring an old hand up to speed. Includes excellent training modules and an arcade type mode to liven things up and put some pressure on; ★★★★+" **INFO-64**

Our customers continue to tell us of their success. . . .

". . . delighted with my son's progress . . . he is the only one in his second grade class who touch types at the computer."

(58 year old man writes) . . . "great, excellent. To me a source of great learning . . . I just can't express how much I have enjoyed it!"

In daily use by schools across the USA.

"Computer aided instruction at its best" ***Commander*** magazine

TYPING TUTOR + WORD INVADERS

The proven way to learn touch typing.

COMMODORE 64 Tape $21.95
COMMODORE 64 Disk $24.95
VIC 20 (unexpanded) Tape $21.95

NEW!

IFR
(FLIGHT SIMULATOR)

CARTRIDGE FOR THE VIC 20

COMMODORE 64
DISK OR TAPE

$39.95
JOYSTICK REQUIRED

Put yourself in the pilot's seat! A very challenging realistic simulation of instrument flying in a light plane. Take off, navigate over difficult terrain, and land at one of the 4 airports. Artificial horizon, ILS, and other working instruments on screen. Full aircraft features. Realistic aircraft performance — stalls/spins, etc. Transport yourself to a real-time adventure in the sky. Flight tested by professional pilots and judged "terrific"!

VISA Shipping and handling $1.00 per order. CA residents add 6% tax. MasterCard

ACADEMY SOFTWARE

P.O. Box 6277, San Rafael, CA 94903 (415) 499-0850

Programmers: Write to our New Program Manager concerning any exceptional VIC 20™ or Commodore 64™ game or other program you have developed. Circle No. 2

TAPES ON COMMAND

- **Games**
- **Education**
- **Business**
- **Utilities**

★★★★★★★★★★★★

The same great programs offered in each issue of *COMMANDER* are now at your command! *TAPES ON COMMAND* will increase your valuable programming time by eliminating typing and proof reading.

Starting with the December issue, enjoy *TAPES ON COMMAND* in tape or disk format. Order a year subscription and save 25%!

Tape $ 9.95 each
Disk $ 13.95 each

To order *TAPES ON COMMAND,* call toll free (800) 426-1830. In Alaska, Hawaii and Washington call direct, (206) 584-6757, or write to *COMMANDER* Magazine at P. O. Box 98827, Tacoma, WA 98498.

Wake up your SID CHIP with

NOTE PRO

Music/Sound Synthesis software for the C-64

You've heard the 64 make great sound effects and music. Now there's a way for you to create your own music and sound effects without learning a strange new language. While the competition forces you to program long alpha-numeric strings to achieve even the shortest piece of music, NOTE PRO is miles ahead, letting you compose on a simple TREBLE CLEF musical staff.

NOTE PRO II, music and sound effects editor and generator is untouched by the competition. It gives you all this and more: 32 step TREBLE CLEF edit pad, 254 choices of tempo, all note durations, choice of LEGATO and STACCATO for each note, TRANSPOSING by octaves, ARRANGEMENT in any sequence, and control of ALL TONE SETTINGS. Use Note Pro II to compose, or type in sheet music. No musical or sound effects accomplishment is out of your reach with Note Pro II.

NOTE PRO BRIDGE is a powerful machine language subroutine which you may copy and add to your own programs. By adding as few as 14 lines to your basic program you can get music and sound effects that would be impossible in BASIC. NOTE PRO BRIDGE will play Note Pro music files or use data that you create within your programs.

NOTE PRO I is a music editor that combines simplicity and versatility. Nothing compares for the money.

PLOT-A-LOT is a hi-res screen utility which allows you to create hi-res screens and add them to your own programs easily.

Note Pro I	tape: $24.95	disk: $27.95
Note Pro II	tape: $46.95	disk: $49.95
Note Pro Bridge	tape: $24.95	disk: $27.95
Plot-A-Lot	tape: $8.95	disk: $17.95

Visa/MC accepted. We are ELECTRONIC LAB INDUSTRIES, 100 W 22nd ST, PO Box 7167, Baltimore, MD—(301) 366-8138. Call or write today for your FREE BROCHURE!

ELI

Circle No. 184

MasterCard

VISA

Commodore® owners:
"THE FUTURE IS HERE..."

Dealer And Distributor Inquiries Invited

Will your printer interface pass the Commodore® printer test? We don't think so!! Ours will.

The CONNECTION™ is truly the ultimate parallel interface for the VIC20™/COMMODORE 64™. This fully intelligent interface plugs into the disk (serial) socket just like the standard printer and you can easily assign it any device number. It will provide virtually TOTAL EMULATION of the Commodore® printer including all standard graphic characters (normal or inverse), column tabbing, dot tabbing, graphic repeat, dot addressable graphics, cursor up/down mode, and more. It responds to all of the standard commands (PRINT #, OPEN, CLOSE, etc.) to insure software designed for the Commodore® printer will operate with the CONNECTION™. Use it in the TOTAL TEXT MODE, or purchase our Universal* CONNECTION that works with virtually EVERY DAISY WHEEL OR MATRIX PRINTER with standard Centronics Parallel configuration. To take full advantage of your printer's special features, please specify the printer type. Available for STAR MICRONICS, BX80, EPSON, OKI, NEC, PROWRITER, BANANA, SEIKOSHA, RITEMAN, GEMINI10X and others. ONLY $119.00 Complete. (Additional ROMs are available if you should ever change printers).

THE CONNECTION PROVIDES:

1) A 2K Printer buffer.
2) Full LED Status indicators.
3) Complete Built in self test.
4) Printer reset switch.
5) Adds Skip over perf, margin set, programmable line length, program list format commands to your printer.
6) No need for extra cost, special tape loader for graphics.
7) All features easily accessed from software.
8) ASCII conversion, TOTAL TEXT, EMULATE, and TRANSPARENT Modes.

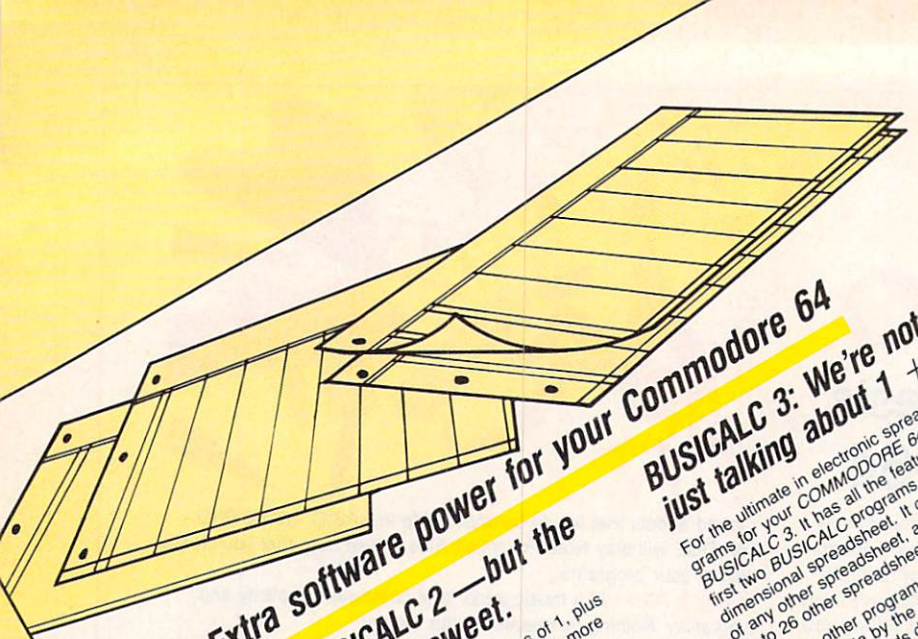
*Note: Only the Universal CONNECTION will not provide 100% Commodore graphics.

ORDER FROM

MICRO WARE D

Circle No. 55

1342B RT 23
BUTLER, NJ 07405 201-838-9027



Extra software power for your Commodore 64 with BUSICALC 2—but the price is still sweet.

BUSICALC 2 has all the capabilities of 1, plus features that you can only find in much more expensive programs. It has a total of 17 commands, for example, including:

- "Save with Replace," a popular feature that lets you easily keep track of data and make revisions;
- Formula print-out;
- "Window framing," a great command that retains row and column headings even as you scroll through a long or wide worksheet, thus reminding you of what the numbers represent;
- A high-speed "find" capacity for creating parts lists and inventories;
- Direct disk commands without leaving your spreadsheet;
- Overall setting of the number of decimal places with exceptions allowed anywhere;
- User defined functions;
- Direct erase command for all or any specified part of your spreadsheet;
- Instant color change without leaving program;
- Direct quit function.

BUSICALC 2 adds 17 (count them, 17) additional built-in math and logic functions. They are Sine, Cosine, Tangent, Logarithm, Square Root, Round-off, Truncation, Absolute, Random, Standard Deviation, Count, and three Logic functions (Positive, Negative and Zero).

USER DEFINED FUNCTIONS

KEYSTROKE	DEFINITION
W	V(1)+V(2)+V(3)
X	V(1)/(1+(V(2)/100)↑V(3))
Y	S(V(2)/2)*V(1)+(P(V(3)-V(4)))

BUSICALC 2 allows up to 999 rows and up to 125 columns. Your total spreadsheet size can be up to 2500 cells (boxes), far surpassing anything previously offered. Like its predecessor, *BUSICALC 2* comes with a 56 page user-friendly manual that has step-by-step procedures and a quick reference section. It also has a nice low price!

BUSICALC 3: We're not just talking about 1 + 2.

For the ultimate in electronic spreadsheet programs for your *COMMODORE 64*, look to the first two *BUSICALC* programs. It has all the features of the *BUSICALC 3*. It also has a 3-dimensional spreadsheet. It can retrieve data off of any other spreadsheet, and you can access up to 26 other spreadsheets at one time.

Whereas other programs are limited in their access to data by the memory in the computer, *BUSICALC 3* reads data off the disk drive. With *BUSICALC 3*, you can reach up to 52,000 boxes (or "cells") of information. This program provides all the power and flexibility a user could ever want in an electronic spreadsheet program.

Chartpak-64: A new companion program to BUSICALC.

This great aid can take data off your spreadsheet and give you back a bar graph or pie chart of that data. These displays look great in formal presentations and reports, but they can also make the implications of data clear. Chartmaster complements *BUSICALC* beautifully; it's a handy program to own.

BUSICALC 1 COMMODORE 64, disk or tape	**$49.00***
BUSICALC 2 COMMODORE 64, disk or tape	**79.00***
BUSICALC 3 COMMODORE 64, disk only	**129.00***
CHARTPAK-64 COMMODORE 64, disk or tape	**42.95***
BUSICALC 20 VIC-20, disk or tape	**49.95***

*There is an additional $3.50 US and Canada, $10.00 Europe and Asia, shipping charge per order. California residents add sales tax.

For CBM-64 and VIC owners only:

This is just 1 of 20 pages of the newest and biggest Skyles catalog, hot off the press.

We know you'll want this page, in its full 7¼ x 9 splendor, and another 19 pages of peripherals, software and books that will make your CBM-64 or VIC computer even nicer to live with. So, if we missed sending you your very own copy within the last few weeks, call us at **(800) 227-9998 (unless you live in California, in which case call (415) 965-1735.**

From Skyles Electric Works, the oldest and largest professional specialists in the business.

Skyles Electric Works
231-E S. Whisman Road
Mountain View, California 94041

Circle No. 210

Duplicating Data Cassettes

By Jim Grubbs

You've had your computer for a while and you've gotten pretty good at writing programs. Now you think you would like to share your programs with others, either by selling them, putting them in the public domain, or maybe just sending them to Uncle Joe for him to use on his machine. Of course you can load the program into the computer from cassette and then copy from the computer on to another blank cassette. This is probably the best way to make a single copy. There is an easier way for making multiple copies or making copies of tapes with multiple programs on them. First a few basics about magnetic recording in general and data recording in specific.

YOU TAKE THE HIGH TONE

When you record music using a tape recorder you are actually placing magnetic patterns on a thin piece of plastic coated with a metal oxide. These patterns consist of many waveforms over a wide frequency range. To hear what you have recorded you use the process in reverse, changing the magnetic patterns back into an electronic signal which can be amplified and fed to your speakers. When you record a computer program on cassette you are doing something very similar. Your computer generates two tones, sometimes called (in old teletype terms) mark and space. By switching rapidly between the two tones, binary (on/off) data can be represented on the tape. This is known as AFSK, audio frequency shift keying. In the case of the VIC and some other machines, some processing of this signal takes place.

Unlike recording music with its complex waveforms of many instruments playing at the same time, for data we can record square waves or something very close to pure square waves to represent our binary ones and zeros. Square waves are what they sound like. Rather than changing amplitude in a gradual fashion or decaying slowly as some instruments do, they rise almost instantaneously and fall just as sharply when completed. This is exactly what we need for data storage, on and off, or high and low tones, with no "twilight zone" region in between them.

Even though we have done a specialized version of recording to best suit the needs of our computer, the end result is still audio frequencies recorded on a cassette tape. Take one of your programs and put it into any cassette recorder used for regular tapes. What you hear when you play it will usually start with a single tone and then a buzz saw sound, followed by another period of single tone at the end of the program. This may be a new experience for many VIC owners who do not normally have the option of hearing their tapes since the Commodore Data Cassette was designed specifically for use with the computer and has no speaker built in. If you have the opportunity to view your tape signal on an oscilloscope, you will see square waves. With a good scope and a lot of patience you can actually freeze a portion of the data and translate it into the contents of the tape at that point.

ALL IN AN EIGHTH OF AN INCH

Let's talk about the format of your data cassette for a moment. The VIC and most other machines record standard "half track" monophonic signals. This means that on a cassette tape, which is an eighth of an inch in width, something a little less than one-sixteenth of an inch is magnetized with the data transmission from your computer. This will leave the bottom half of the tape blank, which means when we finish recording on side one the tape can be flipped over, placing that blank portion on the top side. If everything is in proper alignment on your data cassette and you play back a tape made from your computer on a high quality stereo cassette deck with VU meters you will notice two things. One is that the meters will probably be pinned, that is, indicate maximum level. The other is that the meters should be pretty much at the same level. If one is significantly lower than the other, or the levels waiver back and forth between channels, one of the tape heads is out of alignment, the tape has warped, and/or you are using cheap tape. If you suspect that the tape head on your data cassette is out of alignment, servicing should be obtained from a technician familiar with tape head alignment. It is not something the novice computerist should attempt. Special alignment tapes are used and the head is adjusted to a standard so that it will be in alignment with all tapes that have been recorded properly.

One source of errors in data recording is noise. By keeping the level as high as possible the signal-to-noise ratio can be kept high, reducing the likelihood of noise mutilating the data. Additionally, at full saturation magnetic recording media will tend to clip, that is, the peaks will be flattened out. In this case, that is a desirable effect. After all we want either a high or a low, not something in between. In normal music recording this clipping would be perceived as distortion, but for our purpose a bit of clipping can be helpful. We don't want to overdo it though. After a certain point other nasty things can begin to happen and we end up with undesired signals on our tape.

MASTER AND SLAVE

It is possible to play back your master tape made with your computer on one recorder and duplicate it as you would a

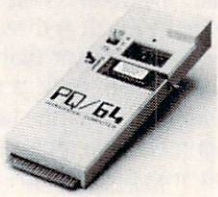
GLOUCESTER COMPUTER

Tools for learning and dedicated applications programming.

PROMQUEEN Write code for most common 8-bit microprocessors, test it in circuit, and burn it on EPROM with this all-in-one micro development system cartridge. Powerful machine code editor provides comprehensive ROMware development support. Ideal for robotics, process control, game development. Commodore VIC-20 host computer. Programs 2716, 2732, 2758 EPROMS and similar EPROMS.

$199.00

PQ/64 all features of Promqueen less mimic mode. Software enhanced to include EPROM QC utilities, RS-232 communication, printouts. 28 pin ZIF socket. Reads, edits runs and programs all 5 volt 2500 and 2700 series EPROMS plus variety of EEPROMS all without personality modules. Commodore C-64 host computer.



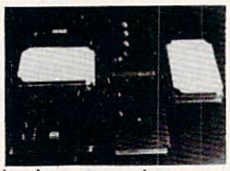
$299.00

PQ/64 RS pack performs RS-232 voltage conversions for PQ/64 system.

$49.00

Plug your applications software into Commodore's computers on Gloucester Computer ROM Packs. Our top quality ROM cartridges include

- bypassing on all chips
- low noise layout with ground plane
- solder mask and gold plated edge connector
- wave soldered assembly and solvent cleaning
- DIP switch for address selection



VIC-20 versions include model V-8 for two 2732 EPROMS and model V-16 for 4 2732 EPROMS. C-64 versions include model C-16 for four 2732 EPROMS and model B-16 for two 2764 EPROMS.

All products shipped with comprehensive documentation. Call our user hotline **617-283-7719** or write for information: Gloucester Computer, 1 Blackburn Center, Gloucester, MA 01930.

Circle No. 19

music tape on another recorder. The taping should always be done with patch cords. Holding a mike to the speaker creates too much background noise and will no doubt result in a copy that will not load. Small portable units can be used as well as high quality stereo cassette decks, but there are some cautions.

If you are using two mono cassette recorders you are pretty much ready to go at this point. If the recorder has a meter on it, set the recording level so that it sits in the red–not against the pin but above the normal level. If you have a tone control, set it to the position that allows maximum high frequency response. A little experimentation may be necessary but you will be on your way to duplicating any program that is stored on cassette.

If you are using two stereo cassette decks, some additional points should be considered. In stereo recording two channels are packed into the space occupied by the single channel in a mono recording. This really starts splitting that eighth inch tape pretty thin with four separate channels being recorded on it. The logical step would be to allow both channels to be recorded at equal level. DON'T DO IT!

"Unlike recording music, for data we can record square waves to represent binary ones and zeros."

Keep in mind that we are dealing with rapidly changing high and low signals representing our binary data. These are being received by the computer at a relatively high speed. Theoretically we have two signals, one on each stereo track, that are absolutely identical. In practice those two signals may be slightly out of step or synchronization with each other. This is guaranteed to drive your computer bonkers. The solution is very simple. Turn down the right channel in the recorder you are using to make the copy. In other words, record left channel only. This will decrease the signal to noise ratio ever so slightly but will eliminate the phasing or sychronization problems mentioned. Use the left channel because it is on the outside of the tape, mimimizing cross talk between the two sides.

ALL IS NOT LOST

Tapes that will not load on your machine due to improper recording may be salvageable using your home stereo system, particularly if you have an equalizer or some method of controlling the tone from one recorder to another. By adjusting the frequency response, usually boosting the high frequencies and/or changing the level, sometimes a bad tape can be saved. Remember the waivering signals mentioned earlier? Look to see which channel, left or right, consistently stays at the highest level and re-record that one, even if it is the right channel. This too, will cure many problems encountered with tapes received from others.

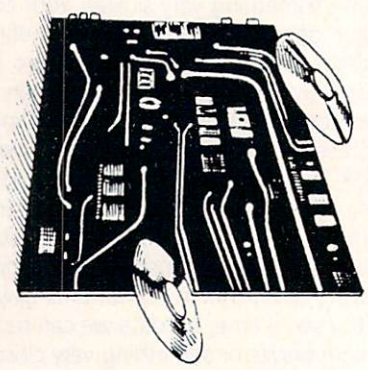
CARE AND FEEDING

Regular cleaning of the tape head in your recorder is a must. The oxide on the tape will clog the tape head which could lead to not being able to load a cassette at all. Periodic cleaning will eliminate this problem. Using a good tape will help even more. Stay away from the three-for-a-dollar variety that you find at the checkout counter in many stores. Check the ads in *COMMANDER*. You will find many high quality cassette tapes specifically formulated for data recording at very reasonable prices.

Another item that many people overlook is a tape head demagnetizer. Continually running a magnetized tape over the tape head is just like running a low power magnet across the heads. After a while the head will become magnetized also, causing more load errors. It may even harm your previously recorded tapes. See your recorder's instruction manual for the proper way to clean and de-magnetize tape heads.

If you have a program that you want to save forever be sure and remove the safety tab in the cassette. There are two of these, one for each side. You will find them on the back edge of the cassette. Removing them will keep you from accidentally recording over your favorite program. If at any time you do want to use the tape to record again, just put a small piece of tape over the hole.

Data storage is a very important part of computing. With the methods described you can record multiple copies of your programs with minimal effort and time.



Introduction to Assembly Language Programming

Part XIII: Wedges

By Eric Giguere

Last month we took a look at the IRQ vector and how to use it to add certain features to the computer. This month we look at a similar concept, involving a routine at the very heart of the BASIC interpreter.

CHRGET

CHRGET is the name for a small machine language routine located from $0073 to $008A in memory. Notice it is located in page zero of memory. Being in page zero allows it to run faster than otherwise possible if it were anywhere else. This is because zero page instructions (ones that access only page zero of memory, such as LDA $02) take less time to execute than absolute (non-zero page) instructions. Refer to Figure 1 for the disassembly of the CHRGET routine.

What is CHRGET used for? Basically, it is used to get a value or 'character' (hence the name) from memory. This may sound trivial, but the fact is that CHRGET is used by most of the BASIC ROM routines. By setting the pointer at $7A and $7B to the start of a BASIC program in memory, the interpreter can retrieve each byte in a line one at a time and process them as needed. CHRGET is also used in the IMMEDIATE or DIRECT mode. This is the mode the computer is in when it isn't running a program, but is waiting for you to enter a command (it displays the famous 'READY.' prompt). When you enter something on the screen, the line is transferred to the input buffer, a section of memory from $0200-$0258 used to interpret commands in immediate mode. Here, too, the BASIC interpreter uses the CHRGET routine to fetch each character from the input buffer, one at a time. CHRGET is truly one of the crucial routines in memory.

CHRGET is also a very efficient piece of code, as you may have surmised by taking a look at Figure 1. Notice the LDA $FFFF in line 9. This is the instruction that retrieves the next character from memory. In this example $FFFF is simply a dummy value; the real value (which we can refer to as POINTR) is always changing. The neat thing about CHRGET is that each call to it increments the POINTR by 1, by incrementing the bytes pointing to the location themselves. Note that if you access the routine starting only at CHRGOT ($0079) you will load the current character being accessed because you haven't increased the pointer. This self-modification feature of CHRGET supplants the need for fancy indexing routines using the X or Y registers.

Besides getting the next character in memory, CHRGET also sets certain status flags depending upon certain conditions. If the character loaded is a colon (ASCII $3A) or a null-byte ($00, indicating the end of program line), the Z flag is set, and a BEQ after a JSR CHRGET will succeed. This checks for end-of-statement/end-of-line. If instead the character happens to be a numeral (0-9, ASCII values $30 to $39), the carry bit will be cleared, thanks to the intriguing code from lines 14 to 17. Otherwise the carry will be set. CHRGET also uses the code at lines 12 and 13 to skip

FIGURE 1

```
FILENAME: CHRGET.OBJ

LINE ADDR   CODE     LABEL   OPC OPERAND         COMMENTS

0001 0073            ; CHRGET ROUTINE
0002 0073            ; AS FOUND IN VIC AND C64
0003 0073            ;
0004 0073                    ORG $0073
0005 0073            ;
0006 0073 E6 7A      CHRGET INC CHRGOT+1    ;INCREMENT LOW BYTE
0007 0075 D0 02              BNE CHRGOT     ;CHECK FOR NEW PAGE
0008 0077 E6 7B              INC CHRGOT+2   ;INCREMENT HIGH BYTE
0009 0079 AD FF FF   CHRGOT LDA $FFFF      ;GET CHARACTER (<$FFFF=DUMMY VALUE)
0010 007C C9 3A              CMP #':        ;CHECK FOR COLON
0011 007E B0 0A              BCS EXIT       ;IF COLON OR GREATER EXIT
0012 0080 C9 20              CMP #32        ;CHECK FOR SPACE
0013 0082 F0 EF              BEQ CHRGET     ;SKIP SPACES
0014 0084 38                 SEC
0015 0085 E9 30              SBC #$30       ;THIS WILL SET THE CARRY BIT
0016 0087 38                 SEC
0017 0088 E9 D0              SBC #$D0       ;WHEN ACC. IS NOT #$30 TO #$39
0018 008A 60         EXIT    RTS
0019 008B            ;
0020 008B            ; NOTE: THE DUMMY BYTES FOLLOWING CHRGOT
0021 008B            ;       CAN BE REFERRED TO AS 'POINTR'
0022 008B            ;

ASSEMBLY COMPLETE.

SYMBOL TABLE:

CHRGET-$0073   CHRGOT-$0079   EXIT---$008A

PROGRAM START: $0073     PROGRAM END: $008B
```

over any spaces (ASCII $20). Any routine calling CHRGET can easily tell if it has reached the end of a statement or if the character retrieved is a numeral (perhaps indicating a program line number). This feature is used in Figure 3, which we'll get to later.

WEDGING INTO CHRGET

Because CHRGET is in RAM we can easily make changes to it. It's possible to intercept characters retrieved by CHRGET and make use of them somehow. Programs such as DOS AID or my very own VICDOS (formerly named DOSPLUS-see the February 1983 issue of *COMMANDER*) actually do this. By slightly altering CHRGET these programs can search for a certain flag character, such as '@' or '>' and if encountered jump to some other routine to execute something (such as sending all characters following the flag to the disk drive as a command). What you use CHRGET for is up to your imagination. But how do you alter CHRGET in the first place?

The solution is to place a 'wedge' right in the middle of CHRGET. A wedge is basically a JMP or JSR instruction 'wedged' into other code to temporarily divert the microprocessor to another piece of code. A wedge is used when there isn't enough memory or it's very awkward to rewrite the whole routine we're wedging into. The wedge can also be referred to as a 'patch', though this is used more often as a reference to corrective code use to improve or correct programs.

Figure 2 is a general CHRGET wedge program, complete with explanations as to what each line of code does. It should be noted that there are several spots to put wedges into CHRGET, but I prefer placing it in line 10 of Figure 1, right after the LDA instruction. Going quickly through Figure 2, lines 10 to 16 initialize the wedge by placing a 'JMP $0349' in the CHRGET routine. This routine is called by a SYS 828 (from BASIC) or a JSR $033C and returns when finished. The CHRGET routine will now jump to $0349 each time it is called. Your initialization routine may make it point somewhere else, but make sure you have the proper code in place. I'll be referring to specific memory locations in my examples but please remember they can refer to anywhere you wish to place them.

Lines 18 to 27 form the wedge routine. Here the character is pushed onto the stack and then examined to see if it is an ampersand ('&'). If not, the routine branches to EXIT. Another check is then made to make sure the computer is in immediate mode. If it is, location $7B will equal 2. A final check is made to make sure 'quote mode' is off, and that this isn't part of a PRINT statement. If everything is OK the original character is pulled off the stack (even though we don't need it) and the routine branches to PROCES. EXIT is a routine that replaces the code we destroyed in CHRGET by placing the wedge. It mimics what happens in lines 10 to 18 of Figure 1.

PROCES is the start of your own processing routine. What you place here is entirely up to you. When you've ended your code you should leave in one of two ways: 1) via a JMP ($0302), or 2) via a JMP $0073. The former will ignore whatever is left of the input line after you processed it, while the latter can be used to let the computer process the rest of the line normally. The choice depends on your program. You should also notice that even though Figure 2 is my 'standard' wedge program, there is still considerable room for change. You can simply change the CMP statement in line 19 to check for a different character, or you could add multiple CMPs for several different functions. Simply keep the same logic shown in Figure 2 and everything should be all right.

Figure 2

FILENAME: WEDGE.OBJ

```
LINE ADDR   CODE     LABEL   OPC OPERAND          COMMENTS

0001 033C            ; GENERAL 'WEDGE' PROGRAM
0002 033C            ; FOR USE ON THE VIC OR C64
0003 033C            ;
0004 033C            ; BY ERIC GIGUERE
0005 033C            ; OCT. 15/83
0006 033C            ;
0007 033C            ;
0008 033C                    ORG $033C       ;PROGRAM STARTS IN CASSETTE BUFFER
0009 033C            ;
0010 033C A9 4C      SETWDG  LDA #$4C        ;PLACE THE OPCODES FOR 'JMP'
0011 033E 85 7C              STA $7C         ;AND THE WEDGE ADDRESS INTO THE
0012 0340 A9 49              LDA #<WEDGE     ;CHRGET ROUTINE
0013 0342 85 7D              STA $7D
0014 0344 A9 03              LDA #>WEDGE
0015 0346 85 7E              STA $7E
0016 0348 60                 RTS             ;WEDGE IS ACTIVATED, RETURN TO BASIC.
0017 0349            ;
0018 0349 48         WEDGE   PHA
0019 034A C9 26              CMP #'&         ;CHECK INCOMING CHARACTER
0020 034C D0 0D              BNE EXIT        ;NOT WHAT WE WANT, SO LEAVE
0021 034E A5 7B              LDA $7B         ;CHECK TO MAKE SURE THERE ISN'T
0022 0350 C9 02              CMP #$02        ;A PROGRAM RUNNING
0023 0352 D0 07              BNE EXIT        ;IF SO, LEAVE
0024 0354 A5 D4              LDA $D4         ;CHECK TO SEE IF QUOTE MODE ON
0025 0356 D0 03              BNE EXIT        ;IF SO, LEAVE
0026 0358 68                 PLA
0027 0359 D0 09              BNE PROCES      ;GO TO  BNE PROCESSING ROUTINE
0028 035B            ;
0029 035B 68         EXIT    PLA
0030 035C C9 3A              CMP #':
0031 035E 90 01              BCC JUMP
0032 0360 60                 RTS
0033 0361 4C 80 00   JUMP    JMP $0080       ;CONTINUE CHRGET
0034 0364            ;
0035 0364 EA         PROCES  NOP             ;ENTER YOUR CODE STARTING HERE
0036 0365            ;
0037 0365            ;
0038 0365 6C 02 03   ENDPRG  JMP ($0302)     ;RETURN TO BASIC WHEN FINISHED
0039 0368                                    ;USING ABOVE LINE

ASSEMBLY COMPLETE.

SYMBOL TABLE:

SETWDG-$033C    WEDGE--$0349    EXIT---$035B    JUMP---$0361    PROCES-$0364
ENDPRG-$0365

PROGRAM START: $033C     'PROGRAM END: $0368
```

MULTIPOKE

As an example of using a wedge in CHRGET, I have included a program I call MULTIPOKE. Loaded into the cassette buffer, MULTIPOKE is basically an extended POKE statement that lets you poke values into successive memory locations without a whole string of POKE statements. To use MULTIPOKE, type in the BASIC loader program for your computer (Figures 4a or 4b) or use an assembler to assemble the listing in Figure 3 and load the code directly. Once in memory the code is activated by a SYS 828, and deactivated by a SYS 919.

The command format for MULTIPOKE is as follows:

&address, value (,value,....,value):

'Address' is the starting memory location to be POKEd while 'value' is a value from 0-255. The command must be in a program line (it won't work in immediate mode) and must end with a colon (':'), even if it's the only thing in the line. What it will do is POKE the first value into memory location 'address', and then POKE the second (if any) into address + 1, and so on until it reaches the end of the statement. Each value must be preceded by a comma. As an example, the line:

10 & 53280, 3, 1:

would POKE 3 into location 53280 and 1 into 53281. MULTIPOKE will also work

Continued on page 132

WORD PROCESSING HAS NEVER BEEN SIMPLER

Brøderbund's Bank Street Writer turns your **Apple, Atari, Commodore 64 or IBM PC** into a powerful word processor with many of the advanced features you'd expect to find only in an expensive business system. Powerful, yet purposefully simple, Bank Street Writer has no complex codes to memorize. The screen guides you every step of the way. It's everything you're ever likely to need in a word processor at a price you can afford. Here are just a few of its many features: • Add, move, insert and erase blocks of text, • Universal search and replace, • Automatic centering and indent, • Automatic word wrap, so you don't have to hyphenate or "return" at the end of each line, • Potent print format routines all in memory, • Disk storage and retrieve functions with password protection, • Document chaining allows you to print documents of unlimited length, • Page headers and automatic page numbering – top or bottom, • Highlighting of text, • Upper and lower case without additional hardware. Brøderbund's Bank Street Writer comes complete with Tutorial and Utility programs, a comprehensive reference manual and a free back-up disk. Student approved, the entire system has been extensively tested by Bank Street College of Education and International Educations. Bank Street Writer. The ground-breaking, sensible combination of word processing power, thoughtful design, and exceptional value.

Bank Street WRITER™

Watch for our soon-to-be-released Bank Street Speller!

The First Word Processor For The Entire Family.

Hardware requirements: Apple version requires Apple IIe or 48K Apple II Plus or 48K Apple II with Applesoft in ROM or RAM, and a 16 sector controller. Atari 400/800/1200XL version requires 48K (BASIC cartridge for use of tutorial). Both versions require only one disk drive.

Brøderbund Software

17 Paul Drive, San Rafael, CA 94903, Telephone (415) 479-1170

Apple is a registered trademark of Apple Computer, Inc. Atari is a registered trademark of Atari, Inc.
Commodore 64 is a registered trademark of Commodore Electronics Ltd. IBM PC is a registered trademark of International Business Machines.

Circle No. 223

CHARTER OFFER
SAVE $2.00 OFF THE BASIC RATE!

RUN

THESE COULD BE THE KEYS TO YOUR FUTURE

Unlock *all* the potential of your Commodore 64 and VIC-20* with **RUN**.

Explore . . . Experiment . . . Enjoy . . . Beginner and expert alike will be taken beyond the manual to the limits of their abilities. Enter your own game programs. Construct a simple hardware add-on. Broaden your scope with unique applications . . . And . . . get a 13th issue FREE!

Enjoy key features like these:

- Games for fun & strategy.
- Programming tips help you learn short cuts.
- Candid reviews help you make money-saving decisions.
- Programs to add to your library.
- Instructions & tutorials to increase your skills.
- Hardware & software modifications help your machine work smart.
- Unique applications broaden your scope.

Here's a system-specific magazine written with you in mind. Written by and for the reader to give time-saving, money-saving hints. You'll get instructions and tutorials to increase your skills, and candid reviews to help you make the right decisions. Most of all though, you'll have fun.

*Commodore 64 and VIC-20 are registered trademarks of Commodore Business Machines, Inc.

Circle No. 182

Commodore 64 and VIC-20 owners are one of the largest groups of computerists today. Enjoy the benefits of this with your own magazine. Be in control like never before. Order **RUN** today and get a 13th issue free with your prepaid order (check or credit card) of only $17.97. Send in the coupon or call toll free **1-800-258-5473.**

*Send me a subscription to **RUN** for only $17.97 per year. I understand that with payment enclosed or credit card order I will receive a FREE issue making a total of 13 issues for $17.97. Save $2.00 off the basic rate!*

☐ *CHECK/MO* ☐ *MC* ☐ *AE* ☐ *VISA* ☐ *BILL ME*

card #_____ exp. date _____

signature _____

name _____

address _____

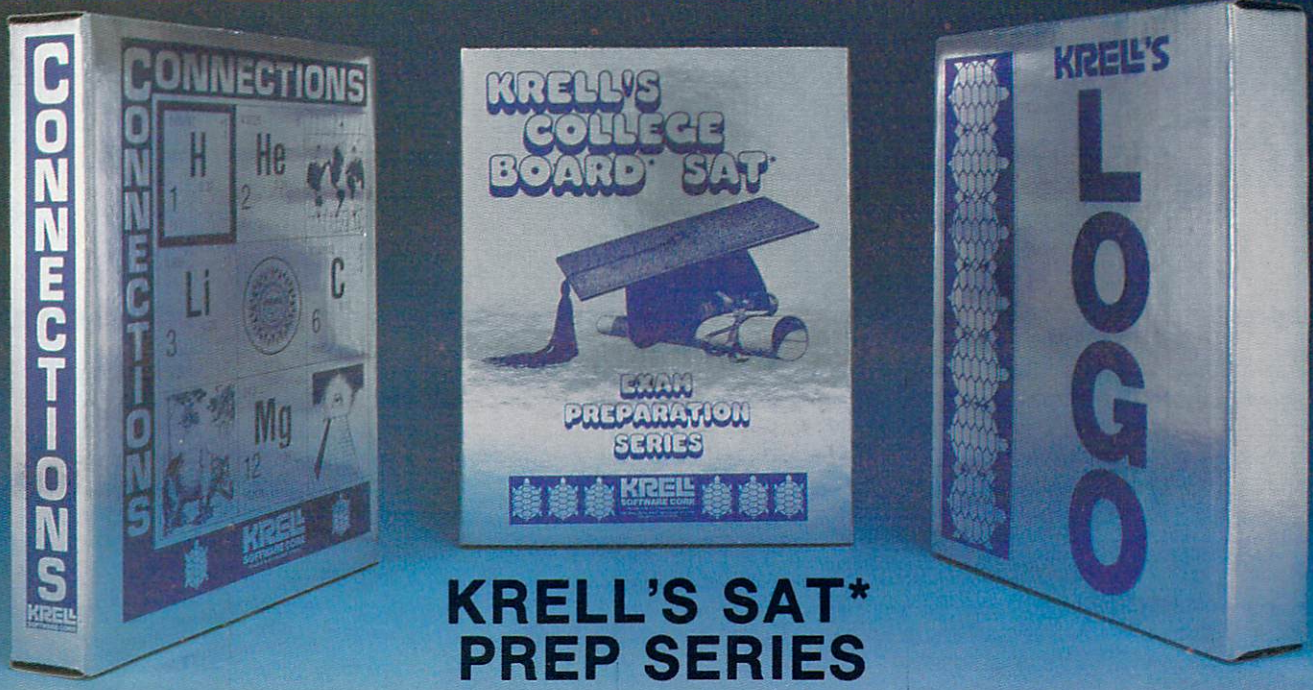
city _____ state _____ zip _____

Canada & Mexico $20.97; Foreign Surface $37.97, 1 year only, US funds drawn on US bank. Foreign airmail, please inquire. Please allow 6 to 8 weeks for delivery. This offer expires January 31, 1984.

RUN • Box 954 • Farmingdale, NY 11737

73DFCM

KRELL *is* EDUCATION



KRELL'S SAT* PREP SERIES

70 POINT SAT SCORE INCREASE WARRANTY*

42 program series. Complete coverage of all SAT* topics including The Test of Standard Written English. All materials presented in SAT* format and at the same level of difficulty encountered in SAT* Exams. Scoring and explanations provided instantly. Krell's unique logical design customizes this multi-disk set for each individual user. *Beware of imitations!* **$299.95**

***Bonus Included*: The As & Bs of Academic Scholarships by Robert Leider and Shelly Schwab, 6th Edition.**

Available at Selected Dealers

CONNECTIONS

Krell's *Connections* is the most exciting development in educational computing since LOGO. *Connections* offers children of all ages a new world of entertainment and intellectual challenge. Parents and educators will be gratified by the intriguing yet serious nature of *Connections*.

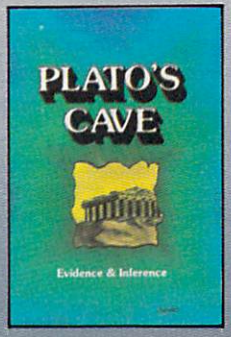
Connections is accompanied by an initial set of data bases (included free with the game system) that deal with geography, chemistry, mammals, mathematics, tools, and everyday objects. *Connections* helps users to build their own data bases and to utilize the data bases created by others via the *Connections User Group Exchange Program*, 48K. **$99.95**

KRELL'S LOGO

The M.I.T. authorized version. Comprehensive 4-disk set includes two copies of LOGO for Apple II™, all utility programs and Sprite drivers, all M.I.T. demonstration programs, shape editor, music editor, 21 program *Alice in Logoland* Tutorial Series, and massive documentation including full color wall chart. THIS IS THE GENUINE ARTICLE! Unlike the version marketed by Apple Corporation, KRELL'S LOGO offers the full package of M.I.T. features including the ability to save pictures.

Spectacular Price **$89.95**

TOP RATED IN INFOWORLD EXCELLENT IN ALL CATEGORIES!



New! ALEXANDER THE GREAT

Available at last!!! *Alexander The Great* is the ultimate game for developing word and arithmetic skills, far better than Scrabble™. *Alexander The Great* permits equal competition between players at different skill levels. Complete graphics and range of options make *Alexander The Great* the best and most challenging, educational tool ever devised. Available for all microcomputers and in a board version, 48K. **$39.95**

New! PLATO'S CAVE

Spectacular game for aspiring scientists of all ages. Players probe *Plato's Cave* with light beams as they explore the relation between illusion and reality and the relation between evidence and inference. Graphic, dynamic, and challenging, with difficulty levels suitable for all, 48K. **$49.95**

CALL OR WRITE FOR A COMPLETE CATALOG

ACORN, APPLE, ATARI, COMMODORE, IBM-PC, RADIO SHACK

Trademarks of Acorn Computer Co., Apple Comp. Corp., Atari Comp., Commodore Corp., IBM, Tandy Corp.

THE GREAT AMERICAN S.A.T. CONTEST

CALL OR WRITE FOR DETAILS

Circle No. 171

VISA MasterCard

N.Y. Residents add sales tax.
Payment in U.S. dollars only.
Prices slightly higher outside U.S.

DEALER INQUIRIES INVITED

KRELL SOFTWARE CORP.
The state of the art in educational computing
1320 Stony Brook Road
Stony Brook, New York 11790

For all orders outside New York State
800-24-KRELL
For information (516) 751-5139

"SAT" and "College Board" are registered trademarks and service marks of the College Entrance Examination Board. Krell Software Corp. has no affiliation with the CEEB and is solely responsible for these programs. Krell's M.I.T. LOGO © 1981, Massachusetts Institute of Technology. Infoworld © 1983 by Popular computing, Inc., a subsidiary of CW Communication, Inc., Framingham, MA. Scrabble is a registered trademark of Selchow and Righter Company.

Electronic Blackboard

Reviews of Educational Software

By Maryanne Dodd

This month I will focus on software designed for computer assisted instruction (CAI) in mathematics. There are probably more educational programs written for math than all of the other academic areas combined. This is because math is a highly structured, precise discipline, and lends itself to computer instruction more readily than most other subjects.

When using CAI, the teacher must always keep in mind the individual needs and abilities of the children using the program. Some programs may be perfect for one child while another child will be bored or frustrated. Also, certain programs assume no prior knowledge in an area and teach whole concepts, while others act as drill or reinforcement of previously learned skills. The programs in this month's review vary in the amount of initial instruction of concepts and the range of skills covered.

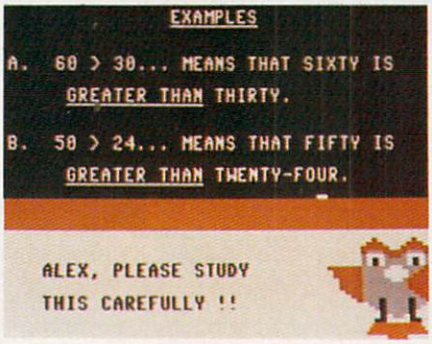
COMPARING WHOLE NUMBERS from Creative Equipment is a CAI package that provides initial instruction of concepts as well as drill. The program is designed around one very specific objective–teaching the relative value of whole numbers.

PINBALL MATH by Taylormade is designed to provide tutoring and drill in the four basic arithmetic operations after the student has had initial instruction.

FLOWER POWER by Softwave provides no teaching of concepts, but does involve multiplication drill at various skill levels.

TITLE:	***COMPARING WHOLE NUMBERS***
FORMAT:	Diskette and Cartridge
PRICE:	$79.95
MODEL:	Commodore 64
AUDIENCE:	Third grade
SUMMARY:	CAI program that teaches the comparison of whole numbers.
SOURCE:	CREATIVE EQUIPMENT 6864 West Flagler Steet Miami, FL 33144 (305) 261-7866

Robin the wise old owl personally invites all third graders to join her for fun and adventure as they learn to compare whole numbers together. This is accomplished through a new software package, COMPARING WHOLE NUMBERS by Robin F. Brown from Creative Equipment.


EXAMPLES
A. 60 > 30... MEANS THAT SIXTY IS GREATER THAN THIRTY.
B. 50 > 24... MEANS THAT FIFTY IS GREATER THAN TWENTY-FOUR.
ALEX, PLEASE STUDY THIS CAREFULLY !!

COMPARING WHOLE NUMBERS is designed to teach the concepts "less than," "greater than," and "equal to" as they relate to whole numbers, on the third grade level. The program is contained on a diskette and cartridge which are loaded into the computer together with an automatic boot. The menu has a choice of four different types of lessons: numbers 0-99, numbers 0-999, numbers 0-9999 and word problems.

After selection is made, Robin the owl says "Hi" and invites the student to type his or her name and age. The program then personalizes the lesson by making a comment about the child's age and referring to the student by name. The comparision symbols and place values are then introduced, followed by several screens of examples. The student's name is used frequently, and Robin draws attention to details on the computer blackboard by pointing with her wing. Follow-up instructions are offered if the initial directions are not fully understood.

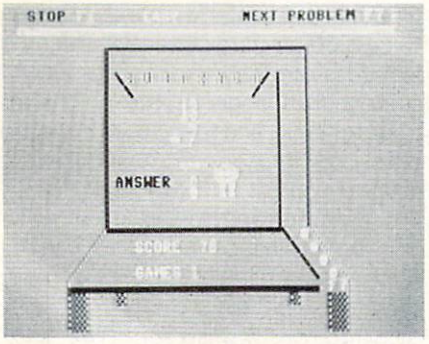
The student then answers comparison questions by using the function keys and keyboard. Correct responses receive positive reinforcement sentences which include the student's name. Incorrect responses bring gentle reminders to check the place value or to remember the symbols. After three consecutive incorrect responses, Robin suggests that the student review the concepts again. Then the computer will automatically present a short review before any new questions are given.

At the end of each lesson there is a summary stating the number correct, the number incorrect and the percentage correct. The computer then tells the student either to proceed to the next lesson or to review the concepts and do the same lesson again.

Also accompanying the program is a loose leaf binder containing complete documentation, specific behavioral objectives for each lesson, and worksheets with pre-tests and post-tests. The documentation is undoubtedly the most complete I have seen for any program. The program is truly "user friendly." Complete instructions are given, including a chart that explains what to do if the program fails to load.

I feel that COMPARING WHOLE NUMBERS is an excellent piece of software for classroom use. The positive interaction with Robin the owl would provide a pleasant learning experience. The program is broad enough that children with a wide range of abilities would benefit from its use. Some students might be able to master comparisons by using just the program a few times, while others might need to use both the program and the worksheets. There is enough to provide everyone with sufficient and varied practice. Even though the program is of such high quality I hesitate to recommend it for home use because of the cost and limited scope. It would be an excellent program to use at home if you have access to a software library, or if a child is having difficulty with the relative value of numbers.

TITLE: PINBALL MATH
FORMAT: Diskette or Cassette
PRICE: Cassette $19.95
Diskette $24.95
MODEL: Commodore 64
SUMMARY: CAI tutorial and drill of basic arithmetic operations.
SOURCE: TAYLORMADE SOFTWARE
P.O. Box 5574
Lincoln, NE 68505
(402) 464-9051



PINBALL MATH from Taylormade is a math tutorial and drill involving the four basic operations (addition, subtraction, multiplication and division). The program centers around a replica of a pinball machine drawn on the screen with math problems displayed inside of it. If the student enters the correct solution the pinball machine lights up, flashes, and produces typical pinball sounds. If an incorrect response is entered a pinball man gobbles up the wrong answer. After three incorrect responses the correct one is displayed.

There are three levels of difficulty for each operation. The easiest level focuses on drill of the basic facts for that operation. During the easy level the child can count the number of balls before they change into numbers on the screen. The remaining two levels provide tutoring and drill of procedures unique to the specific operation.

During the medium level of addition, three-digit addends are used with regrouping occurring randomly. The hard level of addition presents column addition with three addends. A question mark prompts the student to make a keyboard entry, one digit at a time. Responses are entered from right to left and the computer checks and corrects (if necessary) each digit before another one can be entered.

The medium level of subtraction consists of a three digit minuend and a two digit subtrahend with no regrouping. The hard level of subtraction contains problems that may or may not require regrouping. As in addition, the solution is entered from right to left with each digit being individually checked.

The medium level of multiplication has a three digit number multiplied by a single number. At the hard level, a three digit number is multiplied by a two digit number. The student is expected to work the problem on the screen. The program uses question mark prompts to keep place values straight.

The medium and hard division levels are very similar to the multiplication segments in that the medium level has a three-digit number that is divided by a one-digit divisor, and the hard segment has a three-digit number that is divided by a two-digit divisor. The method used to solve the problems is standard long division, similar to that taught in most classrooms. The student enters the quotient and the computer does the multiplying. The student then subtracts and brings down the next number. If an incorrect quotient is entered the computer will prompt with "Too small" or "Too large", and multiply the number that the student entered to demonstrate the error.

Points are recorded on the pinball machine according to the amount of time taken to enter a response. The easy games consist of five hundred points, medium games are one thousand points and hard

Compu-T-shirt™

A very special T-shirt for a very special breed —the CBM owner/user!

With a very special message from the heart!

Lovingly crafted facsimile, with CRT display, of YOUR:

- VIC 20
- Commodore 64
- PET
- SuperPET

ADULTS & KIDS SIZES

Top quality, fully washable, med. wt. 50/50 cotton/poly blend in versatile Soft Beige. Screenprinted in black with bright red heart

$8.50 ea

A Gift to Give or to Keep

Circle No. 150

Please specify Style No., Quantity & Size(s) when ordering.
Style: #A VIC 20; #B Commodore 64; #C PET; #D SuperPET
Sizes: ADULT (Men's) S-M-L-XL KIDS S(6-8) M(10-12) L(14-16)

Ask about our Users Group discount. ■ *Dealer inquiries: (212) 838-8153*

"The Computer Friendly People"
Subterranea Designworks
Dept. CM
P.O. Box 319
New York, NY 10028

☐ Send free data on Users Group discounts.

☐ Send free illustrated "softwear" brochure.

Please send me the following Compu-T-shirts @ $8.50 ea.:
STYLE QTY SIZE (ADULT S M L XL / KIDS S M L)
TOTAL $_____
Add $1.50 ea. for shipping & handling
NYS residents add appropriate sales tax
Enclose check or money order payable to SUBTERRANEA

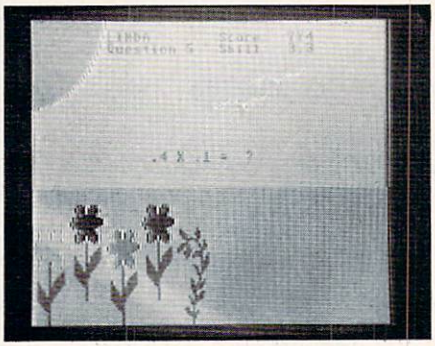
Name _____
Address _____
City _____ State _____ Zip _____
Please allow 4-6 weeks for delivery

games are two thousand points. After game points are attained the points roll over and another game at the same level begins. When the student wishes to end the practice he pushes the "f1" key, and an evaluation consisting of the number of problems, number of games, amount of time taken, and the percentage of first answers correct is given.

PINBALL MATH is built around sound education principles. The methods of solving the problems is the same sequential method found in many elementary school curricula. The numbers are large and presented on a contrasting background that is easy for young children to read. Mistakes are recognized instantly and the student is shown exactly where each mistake occurred. I especially like the non-threatening way the ball gobbles up mistakes so that they are erased and forgotten quickly. Pinball math would definitely be beneficial to a child who is just learning a new math operation such as long division, or to a child who vaguely knows how to do an operation but needs review and practice to achieve mastery.

TITLE: FLOWER POWER

FORMAT: Diskette
PRICE: $39.95
MODEL: Commodore 64
AUDIENCE: First grade through junior high school.
SUMMARY: CAI math drills involving whole numbers, fractions, decimals and the four basic arithmetic operations.
SOURCE: SOFTWAVE
156 Drake Lane
Summertown, TN 38483
(615) 964-3537



FLOWER POWER by Softwave presents an almost unlimited supply of math drills. There are a total of thirteen different problem categories. The student chooses the type of number (whole, fraction, or decimal), and then the basic arithmetic operation (addition, subtraction, multiplication or division). Alternatively the student may choose to practice fraction-decimal conversion.

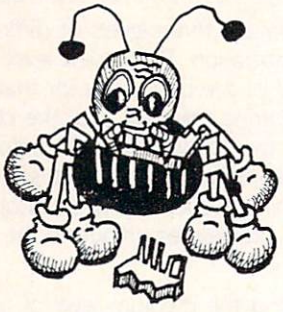
After the student has entered his or her name and chosen the type of practice, a problem appears on the screen "landscape." For each correct response a flower grows in the garden and "right" is flashed on the screen. If an incorrect response is given a weed grows among the flowers and the statement "No, that's not it. Try again" is flashed on the screen. After three tries the correct answer is given. After ten problems a summary is given of the number of correct responses on the first try, as well as a final score based on the number correct and the time taken to enter each response.

FLOWER POWER has the capability of charting students' progress and storing separate data for up to thirty names. The first time the student chooses a type of drill, the program starts at level one. Thereafter, the computer will automatically place each student at the same level attained the last time that he or she used the program. When a series of correct responses are given the computer automatically advances the student to more difficult skill levels. After an incorrect response the computer drops back to a less difficult skill level and gives five practice problems, then gradually increases the difficulty level.

Also included on the diskette is a separate utility program called REPORT. This program lists the skill level of each student for each operation and the high score attained at each level attempted. Individual student's scores may be examined on the screen, and a hard copy of scores for all users may be obtained with a printer.

FLOWER POWER is not a teaching program. There are no explanations or prompts that explain procedures or analyze errors. All problems are presented horizontally and the responses are entered from left to right. There is no provision for the student to work the problems on the screen. In fact, after level five the student will not be able to solve the problems mentally and will need to use paper and pencil. FLOWER POWER is a good program for drill after a student has obtained an understanding of the basic rules governing a given arithmetic operation, but has neither achieved an acceptable level of speed nor a high degree of accuracy. The multiple skill levels allow for utilization by a class or family with a wide range of math abilities. The time factor is present but its effect is subtle. Although points are based upon the duration of time taken to enter a correct response, there is no pressure or penalty. The problem does not flash or disappear when a student takes longer to enter an answer.

The graphics and sound used in the program are simply done. An unobtrusive sound accompanies the growing flowers. The landscape and flowers are shown in bright colors that do not distract from the math. Young primary students will enjoy the immediate reinforcement of flowers growing on the screen. The short segments of ten problems followed by an evaluation will provide the immediate feedback that young students need. Older students may be unimpressed by the flowers and weeds, but will find the multiple levels challenging. With calculator in hand I tried to find the upper limits of the levels but I gave up after reaching level twenty-six. However, I am sure that many sixth graders would try to find the highest level just to prove that it is there.



VIC 20 / COMMODORE 64
INCOME TAX PROGRAM

—1983 Forms 1040, 2441, Schedules A, B, D, G
—Menu Driven
—Saves Tax Data on Disk/Tape
—Optional Printer Output
—Quick Last Minute Changes
—Answers "What If" Questions
—Cassette $49.95/Diskette $51.95
—Postage/Handling Included
—VIC 20 Requires 24K Expander
—Dealer Inquiries Invited

SEND ORDERS OR INQUIRIES TO:

UC SOFTWARE
P.O. BOX 2036
UNIVERSAL CITY, TX 78148

Circle No. 201

BASIC Education: Programming for Learning
Part II: The Quiz

By Andy Van Duyne

Perhaps we all remember with a small amount of terror those days in school when a message would appear on the blackboard saying "Quiz tomorrow", or the teacher would walk into the room armed with freshly dittoed papers for a pop quiz. For many of us the word "quiz" has both bad and humorous connotations–it is a rather funny sounding word, but often one suffered through a quiz as if it were a form of punishment. These short tests, though, can provide valuable information for the teachers (or these days, "learning facilitators") as to the progress of the students in their charge and the identification of individual strengths and weaknesses.

A quiz is used not to teach, but to assess knowledge. It can take several forms, including fill-in-the-blank, writing a short sentence or paragraph, connecting two elements with lines, true/false, or multiple choice.

Of these, several are difficult to "computerize". Fill-in-the-blank would require string inputs, and the evaluation routines would have to be able to handle the vagaries of spelling, spacing, capitalization, or perhaps an answer that is correct but not the teacher's intended response. (This embarrassing situation occurs more frequently than most teachers would like to admit.) These same problems are compounded for sentence input. (Jack bought some magic beans–The beans bought by Jack were magic–Jack purchased some beans that proved to be magic in nature.) Connecting elements with lines would be nice if a light pen were involved, or if the Commodores had a little more sophisticated high resolution ability and the students were proficient with cursor movement.

This leaves true/false and multiple choice on our list. Although these forms of quiz are very easily programmed, they both have their detractors. True/false, some argue, does little to define the student's ability level, and is conducive to guessing. Since an equal distribution of answers is usually a goal in formulating a quiz or test, a student could answer TRUE to every question on a "well designed" true/false test and still score fifty percent correct, even with no knowledge of the subject matter. Critics of multiple choice testing say that it also fails to assess subject knowledge accurately, as the answer is presented to the student (along with the bogus responses) and the student needs only to recognize it instead of hauling the answer up from the depths of the mind.

As mentioned, true/false and multiple choice tests are easily adapted to the computer's binary brain because only a simple entry needs to be made from a limited list of precisely defined choices. Either it is right or it isn't, and no partial credit need be considered. The more common of the two is the multiple choice test.

If you will be testing the same information many times, it might behoove you to write a specific program to administer that specific test. However, writing a whole new program for each multiple choice test soon becomes tedious and more trouble than it is worth. Another approach is illustrated by the two programs listed here. QUIZZER will present a multiple choice test in a standard format. It can include as many questions as the instructor wants. The question is written, followed by four possible responses. Performance analysis is given at the end of the program, with reports on the number of correct and incorrect responses, and the total percentage correct.

The QUIZ WRITER program is used to create files for QUIZZER. Using this system, a teacher can create several different tests by creating several files, each of which can be used by the same testing program. The two programs are designed to run on either the VIC-20 or the C-64, and files created on either machine can also be used on the other one. This is very handy if you shuttle between both computers from home to school, as I do. The interchangeability is achieved by formatting a routine in the QUIZZER program that is used to print all strings. After specifying which computer you are using at the beginning of the RUN, the formatting will take effect so that words are only very rarely broken in the middle. More on this later. Neither program is long or complicated, but by using the tape file technique, the amount of tested material is limited only by the length of the tape used for the file!

THE QUIZ WRITING PROGRAM

Here is an outline of QUIZ WRITER: Lines 10–70 give program title, secure the number of questions and file name, open the file, and record the number of entries to be made. Lines 100–110 get the questions and four choices for answers. Lines 115–117 record which response is correct. Line 120 prints the question, responses, and correct answer to the tape, then loops for the next question. Lines 130–199 close the file and end the program. Lines 200–207 is the string input routine. The string is built using GETs, and your questions and answers can be up to 255 characters long. You may also include commas in your strings. However, when the commas are stored on tape, they are stored as the English pound sign. Otherwise, the comma would be interpreted as

the end of the entry and the information on the tape would not be read correctly on playback. A 'cursor' is represented by the check mark–CHR$(186) in upper/lower case. The delete key is also enabled by using the subroutine at line 220.

The QUIZ WRITER program is rather easy to use. Just have your questions ready and follow the prompts on the screen. You need to supply the file name and number of questions, each question with four choices, and the correct choices, and the correct choice number for each. That's it!

```
10 REM QUIZ WRITER

20 PRINT''[clr][down,
    2 times]**QUIZ[sp
   ]WRITER**''

30 INPUT''[down, 2 ti
   mes]#[sp]OF[sp]QUE
   STIONS[sp]'';HM$

40 INPUT''[down, 2 ti
   mes]NAME[sp]OF[sp]
   FILE[sp]'';F$

50 PRINT''[clr]''CHR$
   (14)

60 OPEN1,1,1,F$

70 PRINT#1,HM$

100 FORN=1TOVAL(HM$)

102 PRINT''[clr][down]
    [shf-Q]UESTION[sp
    ]#''N

104 GOSUB200:A$(1)=Q$

106 FORZ=2TO5

108 PRINT''[shf-A]NSWE
    R[sp]#''Z-1

110 GOSUB200:A$(Z)=Q$:
    NEXT

115 INPUT''[down][shf-
    W]HICH[sp]IS[sp]CO
    RRECT'';C$

117 IFC$<''1''ORC$)''4
    ''THEN115

120 FORZ=1TO5:PRINT#1,
    A$(Z):NEXTZ:PRINT#
    1,C$:NEXTN

130 CLOSE1

140 PRINT''[clr][down,
     2 times][shf-Y]OU
    R[sp]FILE[sp]IS[sp
    ] NOW''

142 PRINT''[down]ON[sp
    ]TAPE....''

199 END

200 REM GET STR

201 Q$='''':PRINTCHR$(
    186);

202 GETA$:IFA$=''''THE
    N202

203 IFA$=CHR$(13)THENP
    RINT:RETURN

204 IFA$=CHR$(20)THENG
    OSUB220:GOTO202

205 PRINT''[left]''A$C
    HR$(186);

206 IFA$='',''THENA$='
    £''

207 Q$=Q$+A$:GOTO202

220 Q$=LEFT$(Q$,LEN(Q$
    )-1):PRINT''[left,
     2 times]''CHR$(18
    6)''[sp][left]'';:
    RETURN
```

GIVING THE QUIZ

QUIZZER presents the quiz that was created. . .Just load and run the program, and use the file tape generated with QUIZ WRITER. Here is the outline: Lines 10–40 start the program and secure the screen width (SW) by asking for which machine is in use. Lines 50–70 get the file name and open the file. Lines 80–96 advise the user how many questions are involved and wait for a RETURN before continuing. Lines 100–112 read the questions and choices from the tape and put them on the screen. Line 112 checks to see if the response is out of range. (This type of string input is used in both programs–it is very easy to check, and will not cause unwanted occurrences if a 'q' is accidentally entered instead of a number). Lines 120–122 check the accuracy of the response and call the appropriate subroutine. Lines 150–199 give the report on the performance of the user and end the program. Lines 200–252 make up the string printout routine. Notice the re-introduction of the commas in line 204. Line 206 is the heart of the formatting procedure. The line is broken whenever the line has reached within 10 characters of the screen width and a space is encountered. This is sufficient for practically all the questions I have tried. If you find that you are using long words frequently, you may wish to change this parameter. The subroutine at 250 takes care of breaking the line and resetting the character count. Line 260 is a general purpose delay routine.

The correct and incorrect response routines begin at lines 300 and 400, respectively. The steps here are very skeletal, and are certainly open to further modification. Remember, the purpose of a quiz is to check knowledge, not to entertain. Any rewards or other feedback should not detract from the task at hand–the quiz. Further installments of BASIC Education will discuss reward systems in greater detail.

A few comments and tips:

1. Even though the programs are interchangeable between the VIC and C-64, keep in mind that the VIC has a much smaller screen capacity. Long questions and answers may cause the VIC to begin scrolling the screen, so that information at the top might be lost.
2. Remember that entries are made in the upper/lower case mode. Adopt a standard for yourself and pupils. File names should either be capitalized always or never. Never is easier.
3. I have little direct experience with the PET, but as far as I can tell, the 40 column format should work on a 40 column PET.

Some future modifications of this program might include a hardcopy performance report, or a report to a tape or disk file. In these cases, the student's name and the use date should be secured at the beginning of the QUIZZER program. If you have any comments, questions, or suggestions, please send them to BASIC Education c/o *COMMANDER*. Enjoy yourself!

Continued on page 43

"PURE MAGIC FROM
THE MOMENT I PLUGGED IT IN."

"...I BUY YOUR SOFTWARE
JUST BY YOUR NAME."

"A PERFECT '10'!"

"...MY HUSBAND
WON'T COME TO DINNER."

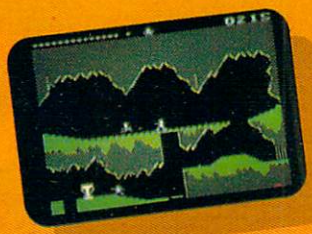
"I NAMED MY DOG SHAMUS..."

synapse

Circle No. 212

SYNAPSE EXCITEMENT

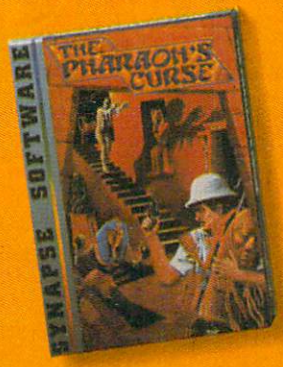
On patrol
Out of the sun comes your RAF biplane, loaded down with a deadly cargo of bombs and bullets. But watch out for the anti-aircraft guns and the enemy fighters—a hit could mean a tricky landing for repairs and ammo. **BLUE MAX.***



Ancient treasure
A fortune is yours for the taking. But can you avoid the ghost of Rama and the evil mummy? Are you nimble enough to leap the chasms and outsmart the booby traps between you and freedom? **The PHARAOH'S CURSE.***

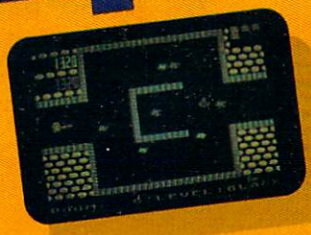
Spellbinding
Only you can restore the forest through ancient spells. Then you must march your army of enchanted trees into battle against the Troglodytes and the evil Necromancer. Who will emerge triumphant from the final conflict? **NECROMANCER.***

Take the controls
Your helicopter mission—capture vital fuel and weapons, free the enslaved masses, and finally destroy the fortress itself. Will you triumph or be crushed by the fiendish Kraalthan lords? **FORT APOCALYPSE.***



*Trademarks of Synapse Software.
Commodore 64 is a registered trademark of Commodore Inc.
© 1983 Synapse Software.

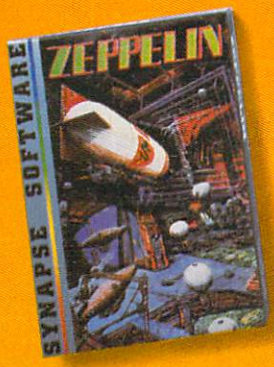
FOR YOUR C-64!



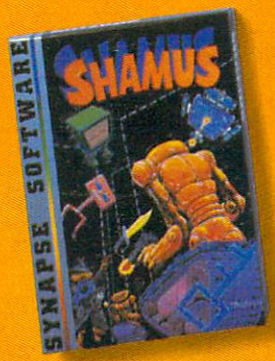
Very hot air
First the prison break, but that's only the beginning! The underground world of Zarkafir is full of surprises, from the lethal energy fields to devastating earthquakes. Can you defeat the Timelords? **ZEPPELIN.***

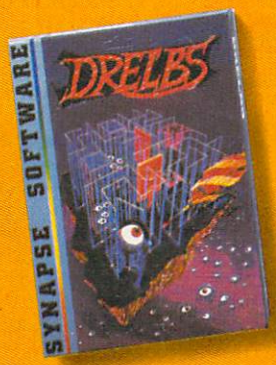
The Shadow knows
Deep in his lair the Shadow waits, protected by deadly Robo-Droids, Whirling Drones and Snap-Jumpers. Only the very strong and the very quick are ever seen again! **SHAMUS*** & **SHAMUS CASE II.***

Awesome action
Maybe you've played pinball before, but not like this! No time to think, no room to make even one mistake. Just quick reflexes, light body armor and a whole lot of luck between you and the end of the game. **SLAM BALL.***



Flip-flop
Into this miniature land comes the evil Trollaboars, determined to take over. Their screwhead tanks will surely crush the peaceful Drelbs, unless you can defeat them on the atomic flip grid. **DRELBS.***





Write for a FREE catalog and Elite Club information.

Synapse games are also available on disk and cassette for the Atari, Apple and IBM home computers.

Name _____

Address _____

City _____

State _____ Zip _____

Computer _____ C

synapse

5221 Central Avenue, Richmond, CA 94804 • 415/527-7751

Circle No. 212

Look at these Features

- Fully screen-oriented
- Horizontal and vertical scrolling
- Terminal mode — never seen before on a wordprocessor
- Supports Commodore disk and cassette handling
- Imbedded commands

Bliztext

Wordprocessor for Commodore 64

BLIZTEXT is a trademark of ELCOMP PUBLISHING, INC.

Commodore-64 and VIC-20 are trademarks of Commodore Business Machines.

Dealer and Distributor inquiries are invited.

BLIZTEXT – SUPER WORDPROCESSOR for the Commodore-64

— ON SALE NOW! —

- Fully screen-oriented, up/down, left and right scrolling – Upper and lower case
- More than 70 commands
- Full I/O compatibility with Commodore peripherals Upper and lower case
- Works with practically every printer on the market, user definable printer control commands
- INCLUDE command allows handling large files on up to 4 diskettes or on cassette.
- Build in terminal software for electronic mail and networking. Telecommunications mode, upload and download, save on disk or cassette.
- Dynamic formatting, Imbedded commands
- Single keystroke for disk directory and error channel
- Program comes on disk or cassette
- Double line spacing, left and right margin justification, centering, page numbering, and practically everything one expects from a good wordprocessor.

AVAILABLE NOW!

Order # 4965 $89.00
Manual only (62 pages) $29.95

MACROFIRE – Editor/Assembler for the Commodore-64

ON SALE NOW
AVAILABLE IMMEDIATELY

One outstanding tool, consisting of 3 powerful elements combined into one efficient program!

1.) Fully screen-oriented Editor (more than 70 commands)
2.) Very fast assembler with macro capability
3.) Machine Language Monitor

Assembly can be started from the editor. Translates in 3 passes. More than 1,000 lables, screen oriented/no line numbers, scrolling, includes disk files.
Practically everything the serious machine language programmer needs everyday!

Manual only $19.95
Order # 4963 $89.00

THE GREAT BOOK OF GAMES, VOL.I,

by Franz Ende
46 programs for the Commodore 64
Introduction to graphics and sound. How to program your own games. Walking pictures, animation, high resolution graphics, programming tips and tricks, hints and useful subroutines for the beginner and advanced programmer. This book is a MUST for every C-64 owner.
Come and get it — It's yours for only $ 9.95
Order # 182 128 pages $9.95
Programs from the book on disk.
Order # 4988 $19.95

MORE ON THE SIXTYFOUR, by H.-C. Wagner

How to get the most out of your powerful Commodore 64. Very important subroutines, tricks and hints in machine language for your C-64. How to modify DOS. How to connect a parallel and serial printer. How to design your own terminal program for communication and networking. Dig into I/O for cassette and disk.
Order # 183 $9.95
Programs from the book on disk
Order # 4989 $19.95

NEW PRODUCTS

Watch out for our new books, software and add-ons to come soon. ON SALE NOW! – ORDER TODAY!

How to program in 6502 Machine Language on your C-64, by S. Roberts (Introduction)

Order-# 184 $12.95

Commodore-64 Tune-up, Vol. I, by S. Roberts

How to expand and customize your C-64.
Order # 185 $12.95

Small Business Programs for the Commodore-64

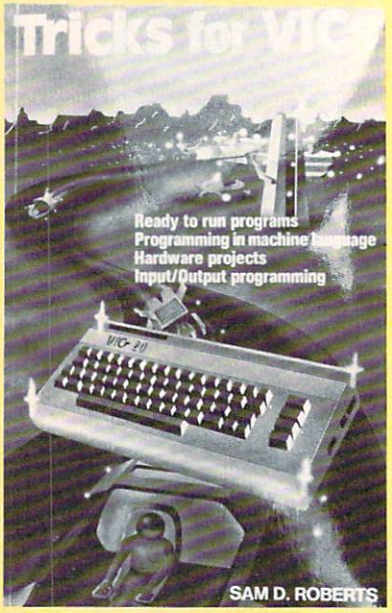
by S. Roberts
How to make money using your C-64. Mailing list, invoice writing, inventory, simple wordprocessing and much more.
Order # 186 $12.95

Hardware Add-Ons:

Parallel printer interface KIT	Order # 4990	$ 19.95
Direct Connect Modem KIT	Order # 4991	Ask f.price
Universal Experimenter Board	Order # 4970	$ 9.95
Expansion Board, space for four experimenter boards(board only)	Order # 4992	$ 29.95

For your VIC-20

Tricks for VICs $ 9.95
Universal Experimenter board



HOFACKER

Circle No. 130

PAYMENT: check, money order, VISA, MASTER CARD, Eurocheck, ACCESS, Interbank
Prepaid orders add $3.50 for shipping (USA)
$5.00 handling for C.O.D.
All orders outside USA: add 15 % shipping, California residents add 6.5 % sales tax.

ELCOMP PUBLISHING, INC
53 Redrock Lane
Pomona, CA 91766
Phone: (714) 623 8314
Telex: 29 81 91

```
10 REM QUIZZER

15 PRINTCHR$(14)

20 INPUT''[clr][down, 3 times]1=[shf-V][shf-I][shf-C][sp]2=64'';W$:IFW$<''1''ORW$>''2''THEN20

30 IFW$=''1''THENSW=22:GOTO50

40 SW=40

50 PRINT''[clr]''TAB(SW/2-6)''**[shf-Q][shf-U][shf-I][shf-Z, 2 times][shf-E][shf-R]**''

60 INPUT''[down, 3 times][shf-W]HICH[sp][shf-F]ILE'';F$

70 OPEN1,1,0,F$

80 INPUT#1,HM$

90 Q$=''[clr][shf-T]HIS[sp]QUIZ[sp]HAS[sp]''+HM$+''[sp]QUESTIONS.'':GOSUB200

95 PRINT''[down][shf-T]OUCH[sp][rvs-on][shf-R][shf-E][shf-T][shf-U][shf-R][shf-N][rvs-off]...''

96 GETA$:IFA$<>CHR$(13)THEN96

100 FORN=1TOVAL(HM$)

102 FORZ=1TO5:INPUT#1,A$(Z):NEXT:INPUT#1,C$

104 PRINT''[clr][shf-Q]UESTION[sp]#''N'':[down]''

106 Q$=A$(1):GOSUB200

108 FORZ=2TO5:PRINT''[down][left]''Z-1''[left].[sp]'';:Q$=A$(Z):GOSUB200:NEXT

110 INPUT''[down][shf-W]HICH[sp]IS[sp]CORRECT[sp][left]'';G$

112 IFG$<''1''ORG$>''4''ORLEN(G$)>1THENPRINT''[up, 2 times]'';:GOTO110

120 IFC$=G$THENGOSUB300:GOTO124

122 GOSUB400

124 NEXTN

150 REM DONE

152 Q$=''[clr][down, 2 times][shf-T]HAT'S[sp]THE[sp]LAST[sp]QUESTION.'':GOSUB200

154 Q$=''[down][shf-T]HE[sp]QUIZ[sp]INCLUDED[sp]''+HM$+''[sp]QUESTIONS.'':GOSUB200

156 CO=VAL(HM$)-WR:CO$=STR$(CO):CO$=RIGHT$(CO$,LEN(CO$)-1)

157 WR$=STR$(WR):WR$=RIGHT$(WR$,LEN(WR$)-1)

158 SC=INT(CO/(VAL(HM$))*100+.5):SC$=STR$(SC):SC$=RIGHT$(SC$,LEN(SC$)-1)

160 Q$=''[down][shf-Y]OU[sp]CORRECTLY[sp]ANSWERED[sp]''+CO$+''.'':GOSUB200

162 Q$=''[down][shf-Y]OU[sp]MISSED[sp]''+WR$+''.'':GOSUB200

164 Q$=''[down][shf-Y]OUR[sp]SCORE[sp]WAS[sp]''+SC$+''%.'':GOSUB200

199 END

200 REM PRINT STRING

202 CC=0

204 FORB=1TOLEN(Q$):B$=MID$(Q$,B,1):IFB$=''£''THENB$='',''

205 PRINTB$;

206 CC=CC+1:IFCC>SW-10THENGOSUB250

210 NEXT:PRINT:RETURN

250 IFB$=CHR$(32)ORB$=CHR$(160)THENPRINT:CC=0

252 RETURN

260 FORP=1TO2E3:NEXT:RETURN

300 REM RIGHT

302 PRINT''[down][rvs-on][shf-C][shf-O][shf-R, 2 times][shf-E][shf-C][shf-T]!!!

304 GOSUB260:RETURN

400 REM WRONG

402 WR=WR+1:PRINT''[down]''

404 Q$=''[shf-N]O,[sp]THE[sp]ANSWER[sp]IS[sp]''+C$+''.''

406 GOSUB200:GOSUB260:RETURN
```

Finally! An Affordable Full-Size, Full-Feature PRINTER

For your VIC-20®, C-64® ATARI®

Centronics Parallel Types
And RS-232 Serial Types

SUG. LIST $299

$ 199.95!!

BASIC PRINTER
(Requires one Option Below)

This printer's mechanism (manufactured by Seikosha) is the same as used by Commodore, Gorilla, Bannana (Leading Edge) and others. It is 67% faster than a Commodore 1525!

FEATURES:

- Full graphics capability.
- In the graphic mode, a column of graphic data can be repeated as many times as you want with a single command.
- Double width character output under software control (5 char. per inch).
- Print position addressable by character or dot (positioning control).
- Graphic character and double width character modes can be intermixed on a single line.
- Automatic printing. When the text exceeds the maximum line length no data is lost due to overflow.
- Self-test printing mode.
- Paper width is adjustable up to 10 inches. Standard plain paper. Tractor feed.
- Unidirectional printing - Better registration.
- 80 characters per line.
- 5 × 7 dot matrix.
- Full 1 yr. Warranty.
- Foreign character sets For U.S., U.K., Sweden, and Germany.

Any of these **Options** allow you to connect and print.

APROPRINT-2064™ (pictured) . . . . .Add: 59.95
For Commodore **VIC-20 & C-64** - Cable included. 50 cps.

APROPRINT-4080™ . . . . . .Add: 59.95
For **all Atari Computers** - Cable included. 30 cps. 2 yr. warranty.

APROPRINT-1000™ . . . . . .Add: 29.95
RS-232-Serial

APROPRINT-8000™ . . . . . .Add: 29.95
Centronics type Parallel - 50 cps.

ADD: $8.00 shipp ng (cont. USA), $35.00 (Canada, HI, AK)

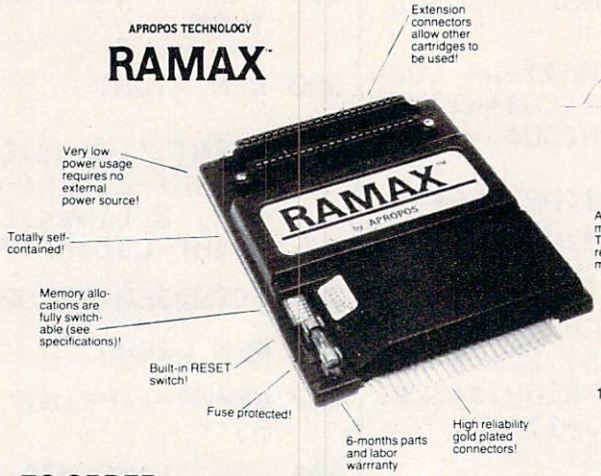
(All other foreign orders Add $75.00 (shipped by Air)

The ONE VIC-20® Memory Expansion Board that DOES IT ALL!

Maximum Memory allows you to use more powerful programs for:
- EDUCATION • ENTERTAINMENT • MAIL LISTS
- BUSINESS APPLICATIONS • FINANCIAL RECORDS

APROPOS TECHNOLOGY

RAMAX


Extension connectors allow other cartridges to be used!
Very low power usage requires no external power source!
Totally self-contained!
Memory allocations are fully switchable (see specifications)!
Built-in RESET switch!
Fuse protected!
6-months parts and labor warrranty
High reliability gold plated connectors!
RAMAX
by APROPOS

To equal the total memory of RAMAX™ you would have to buy a 16k Memory Expansion, PLUS an 8k Expansion, PLUS 3k Expansion. THEN you would need a "mother board". With RAMAX™ you buy just ONE piece . . .at ABOUT HALF THE PRICE!

RAMAX™ Features and Specifications:

- Adds up to a full 27k bytes of additional RAM to the standard VIC-20's internal RAM of 5k.
- Built-in switch allows User selection of any combination of 5 areas or RAM memory*:
  BLK1 (8k: Adr. 8192-16383
  BLK 2 (8k: Adr. 16384-24575)
  BLK 3 (8k: Adr. 24576-32767)
  BLK 5 (Adr. 40960-49151, allows/disallows 8k ROM games)
  RAM (3k: Adr. 1024-4095)
  RESET (Resets computer without power off/on)
- Built-in electrical Fuse to protect equipment.
- Totally self-contained. No external power supply needed.
- Two (2) extension connectors allow ANY additional cartridges and/or devices designed for the VIC expansion port.
- Very low power consumption (.175 amp usual).
- High reliability gold-plated connectors are designed for long life.
- Complete Operating Manual.
- 6 month parts and labor warranty to original purchaser.
- Factory service.

*Many VIC-20 cartridges and programs require certain configurations of the memory (i.e certain games will only run on the unexpanded VIC while others require the upper portion of the expanded memory). With RAMAX™ you have switches that turn-on and turn-off portions of the memory to provide the right area of memory - all without plugging or unplugging. It's so easy!

A perfect investment to give your family and yourself more enjoyment and use from your home computer! The ease of operation, the neat appearance, and the real POWER it adds to your VIC at this low price makes it a MUST for every VIC home!

SPECIAL LOW PRICE!

Only $89.95

Price includes shipping and handling within Continental USA. Foreign orders please add $25.00. Calif. Residents add 6% sales tax.

10 DAY MONEY-BACK GUARANTEE
If not satisfied, simply return in original condition for your money back.

RAMAX Jr.™

Already own an 8k Expander? Get the NEW **RAMAX Jr.™**! Identical to the RAMAX™ except with 19k instead of 27k. Our instructions will show you how to use your 8k as BLK 3 with Jr. to get the full complement of memory!

Special Only $79.95
Shipping included

TO ORDER:

Send Check or Money Order For the Total
Calif. residents add 6% tax.
Or Contact your Local Dealer
Phone orders Call **(805) 482-3604**

VISA All Prices U.S. Dollars MasterCard

CHARGE CARDS ADD 3%

DEALER INQUIRIES WELCOME

WE SERVICE WHAT WE SELL

VIC-20 & Commodore-64 are registered trademarks of Commodore International. Atari is a trademark of Atari Inc.

APROPOS TECHNOLOGY
1071-A Avenida Acaso
Camarillo, CA 93010

New Product!

APROSPAND-64™ Gives your Commodore 64 full expandability. This superbly designed expansion module plugs into the 64 & gives you 4 switchable (singly or in any combination) expansion connectors - plus fuse protection - plus a reset button! only **$49.95**
Shipping included

In Canada contact **TENTREX** Phone (416) 272-1198

APROPOS TECHNOLOGY

Circle No. 37

The Pro Gram

"IN THE BEGINNING THERE WERE FILES . . ."

By Jerry B. Byrd

This month I am going to depart from our standard approach of dividing the article into a philosophical and a practical section. Because the philosophy part for this topic is longer than usual, I am deferring the practical discussion until next month in order to give it the full attention it deserves.

Let me first say that I am going to approach the subject of files from a slightly non-standard point of view. If you are a new reader of *COMMANDER,* let me encourage you to get all the back issues you can. Each of my installments has built on what has gone before. While it is not mandatory that you look at older columns, I have a feeling that it might be helpful to see where I am coming from.

FILES, FILES AND FILES

When I was in the Air Force, there was one particular term that had great potential for confusion. It was the word, "airman." This word has three distinctly different definitions. First, it means all Air Force personnel, as opposed to swabbies of the Navy or footpounders of the Army. Second, it means enlisted personnel, as opposed to officers. Last, it can mean a particular rank, that of airman, versus sergeant. Due to this multiplicity of meaning, the word was almost unusable.

"Some manufacturers use the word 'file' to mean anything attached to the processor."

A similar situation exists in the computer world with the term "file." Some books and manufacturers use the word as a reference to anything that is attached to the processor. Terminals are files, disk drive units are files, printers are files, and sometimes even co-processors and banks of memory are files! This rather global definition of files is not what Commodore has used, so our requirements dictate that we can press on to other definitions.

A second definition of "file" is any information that is semi-permanently stored on some media for future use. The media most often imagined are disks and tapes. But the list doesn't end there. A more complete list of possible media would have to include punched cards and paper tape, magnetic cards, and even paper print-outs. Add to that the more esoteric possibilities of bubble memory, battery supported ram, off-line central data banks (read modem), and even direct computer-to-computer connection, where each computer becomes a "file" for the other(s).

I/O DEVICES

In our discussion, we will mainly pay attention to the more mundane files of this genre, the disk and tape. Commodore does not call the actual units a file, however, but rather calls them devices. I like this distinction, since there is now a clear break between the storage medium itself and that which is stored *on* the medium. This makes conceptualization far easier. Before we can proceed into our discussion of files, I think there is merit in digressing for just a moment and looking at the concept of devices, as used by Commodore. In our three definitions of files above, Commodore has opted for the second as their basic definition of device. Really, any device carries a connotation of I/O (input/output).

Input occurs when the computer *receives* something from the outside world (usually an operator or a file), and output occurs when the computer *sends* something to the outside world (again, usually an operator or file). Let me give you a quick list of the devices of Commodore computers:

0 = keyboard
1 = tape drive
2 = second tape drive (PET and
= CBM machines)
= user port (VIC and C-64)
= RS232 port ('B' models)
3 = screen
4 = printer
5 = modem (CBM8010)
8 = disk drive
14 = special device of interface
(MuPet II, TNW 103
modem, etc.)

This list is not exhaustive. Additional devices of the same type usually are numbered one higher than the standard (second disk drives are thus usually numbered 9).

Of the above listed devices, most cannot support more than one division of itself simultaneously and independently. For example, the printer, while it might have two separate sheets of paper in it, cannot be told to independently print to paper 1 or paper 2. (Yes, I know how to do it, too, but the printer doesn't.) The exceptions to this are the disk drive. Consequently, it is not mandatory (in some cases, not allowed) to name a particular file on any device except the disk drive; and there it is mandatory to name which particular file is being addressed.

GETTING INTO FILES

We now come to the third definition of our word, "file." This is a specific set (grouping) of information to be I/O'ed by the computer. This is the more normal use of the term "file." At this point, things may get a little confusing. We can treat all of the devices listed above as if they were a file (with the exception of the disk drive).

In order to work with a file, it must be opened. BASIC has the command OPEN for this purpose. The OPEN command tells the computer all it needs to know about

the file to be accessed. We will look at a couple of OPEN statements later to see exactly how they operate. While not always mandatory (sometimes it is), the CLOSE state tells the computer that we are through with a particular file. Since the Commodore computer can have only 10 open files at once (don't complain, the IBM PC can have only 3), not closing unneeded files limits the total number we can access. Commodore disk drives can only have 5 or fewer open disk files at one time. More on that later.

There are 3 more commands that are used with files: INPUT#, PRINT#, and GET#. If you have done much programming at all, you will recognize at least part of these commands. Each of them has been used to INPUT, PRINT, and GET from the default devices. When your computer first is turned on, it sets the screen (device 3) as the default output device and the keyboard (device0) as the default input device. These values are in RAM and can be POKEd to change to some other device. For output, BASIC gives us a command to do this, CMD plus the file number (I'll explain file numbers next month) to change the default output to the selected file (and, by extension through the OPEN statement device).

Let's spend a moment talking about the various types of files. Not all of these will apply to all devices, and most of you probably don't have all devices, but if you are really tracking toward a career in programming, or if you are a typical computerist, you have your sights set on more and more equipment.

Commodore uses and recognizes four types of files. (Some would say, five, and, in fact, I am going to look at five.) They are PGM (program), SEQ (sequential), REL (relative), and USR (user). In turn, each of these, except relative, are further divided into input (read) and output (write) files.

PROGRAM FILES

Program files may be written to and read from both tape and disk. There are two ways to input the files for both, and two ways to write the file to disk, but only one way to write it to tape. You are probably familiar with the SAVE and LOAD commands (plus DSAVE and DLOAD for BASIC 4 users). These are one method of reading and writing programs. SAVE is the only method to write to tape. Program files can be read, one byte at a time, by opening them with the proper para meters. This is helpful to check one program against another, but is *extremely* slow. This is because the GET# command operates very slowly in BASIC. There are some other things that this capability can be used for, such as copying programs from one disk unit to another, etc.

Programs are just files that contain instructions to the computer. Most often, these files are not actually read, in the traditional sense of the term, but are loaded into memory for various operations. In fact, one program can load another into memory and it will then automatically begin operation. This process is called "chaining." One note: the first program which loads another program in such a fashion, on all Commodore computers except the new 'B' series, must be larger than any subsequent program, or must make the computer think it is larger by making it look bigger than it is. I will have a whole column about this in the future.

SEQUENTIAL FILES

Sequential files are the easiest files to use. This is why most software makes such great use of them. It is the reason for their use in the earlier installments of this column. There are three things you can do with sequential files: read, write, and append. Append means to add to the end. You can always make a sequential file longer, but you can neither make it smaller nor re-arrange it to better suit your needs. There is one other problem with it: if, for any reason, a program neglects to close a sequential file that is being written or appended to, the disk will be left with an open write file. This can be recognized on the directory by an asterisk next to the file type (e.g.,*seq.). If this occurs, and the disk has not been removed from the drive, it is possible to close the file by one of two options.

"Commodore uses four types of files: program, sequential, relative, and user."

You can use the DCLOSE command on BASIC 4 or CLOSE the command channel to the disk drive in BASIC 3. (See previous columns for a discussion of the command channel.) If this doesn't do it, then one last chance exists: OPEN the command channel and CLOSE it. (Syntax:OPEN15,8,15: CLOSE15.) If this doesn't fix it, then nothing will. You are in a position at this point of losing your entire sequential file. Wrong action at this point may also cause a loss of the entire disk! Proceed carefully.

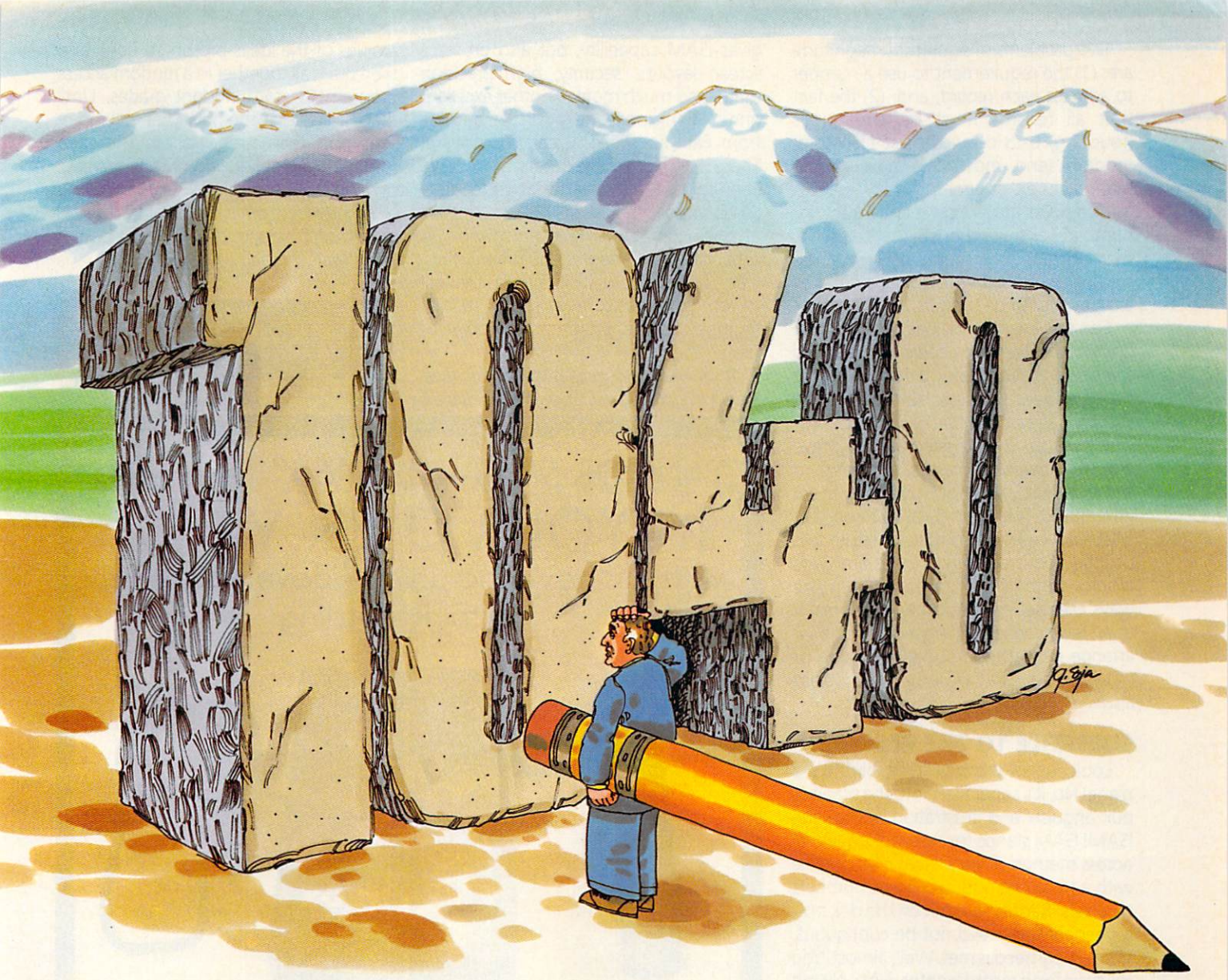
The open write file must not be left on the disk. It indicates a basic confusion in the DOS (disk operating system) that may be made even more pronounced later. The open file may be removed from the disk very safely with the COLLECT or VALIDATE commands. Be aware that use of these commands on a disk with random access files may cause the loss of that random access data if more data is added to the disk. The only safe thing to do is copy the data to another disk using the copy routines found within the specific software package. The COLLECT and VALIDATE commands cause the DOS to check each file for a complete chain of all the blocks it uses and then release all other space on the disk to be used for later storage. Some random files are not chained the normal Commodore way. Good software will provide copying routines to move data from one disk to another, if direct access files are being used.

The obvious relationship among the pieces of information in a sequential file is that of being in a tunnel, end-to-end. It is impossible to read the information in the middle of the tunnel without reading all the information ahead of that which is desired. This limitation represents the greatest problem associated with sequential files. If the information stored in a sequential file is to be manipulated in any way (sorted, portions deleted, modified, etc.), then the entire file must be moved to memory and then back to the disk, a process that is severely limited by memory and relatively slow.

RELATIVE FILES

Relative files address the need to change, modify, delete, etc. the contents of a particular piece of information without the need to read through the large, unrelated portions of the file. Relative files allow nearly instant access to a particular piece of information. This means that you can get the address of a particular person from a mailing list file and change just that without the need to read all the people on the file ahead of the desired name. The exact methodology for doing that will be discussed next month. This great boon to programming for information management is not without its problems, however.

The problems associated with relative files are, for the most part, minor. Fixed record length, which means that you must reserve empty disk space for the longest possible name, is of consideration with small disk sizes and/or overly generous expectation for record lengths. For example, if most of the people on a mail list have last names like Jones and Smith, with only one named Anistoskiostisis, insuring that the longest name fits the space means significant wasting of disk space on all the other names. The fact that fewer relative files may be open on the disk at one time is also of some consideration in some circumstances.



It's that time again.

Deductibles? Itemization? Short forms? Long hours. Those familiar tremors at tax time.

Relax.

This year you and your personal Commodore 64™ can process your own computerized tax return—just like the professionals do—easily, conveniently, quickly…with TaxQwik®.

TaxQwik is a complete tax preparation system that can analyze your total tax picture, perform income averaging and recommend the most advantageous options. If you have a printer, TaxQwik can save you even more time. It can automatically print on standard government tax forms, one page at a time. Error-free. Hassle-free. Stress-free. And, TaxQwik is revised annually to keep current with changing tax laws.

An easy-to-follow instruction manual guides you every step of the way. It's never been easier or more convenient doing your taxes.

Who knows, TaxQwik may even make it fun.

$99.95 (tax deductible, of course)

Available at the software retail store nearest you, or directly from:

commodore
(Officially approved by Commodore)

GENEVA TECHNOLOGIES CORP.
225 Christiani Street
Cranford, NJ 07016
(201) 276-1144

TaxQwik® is a registered trademark of Geneva Technologies Corp.
Commodore 64™ is a trademark of Commodore Electronics, Ltd.

Two problems of significant magnitude are: (1) the requirement to use a number to address each record; and, (2) the fact that all records must be contiguous (touching). Let's look at the last, first. Commodore (and most, if not all, other manufacturers supporting this file structure) require that if you want 2 records, number 1 and number 500, to be on file, then records 2 through 499 must be created and put on the disk, even if they are not ever to be used.

Can you imagine the chaos that would be created if the postal service announced tomorrow that henceforth there would be no more street addresses but just numbers (did they already do that?)! That is exactly the situation when the records may have only numbered addresses. No more is there a Mr.Smith or inventory item R4T568D2. There is only a 342 and part 3126. Notice how this nomenclature tells us little about anything. There are ways around both these limitations, but the ways themselves raise other problems. If there is a need (and there always is) to rearrange (sort) the information in one or more orders, that becomes a problem also.

SUPERFILE TO THE RESCUE?

Look, up in the sky! It's a bird! It's a plane! No, it's super file! Onto the scene of our anguish and frustration comes the ISAM! ISAM stands for indexed sequential access method. Think of it as a relative file with a twist: the address can be numbers or letters. Records are put on the disk only if needed; they need not be contiguous. Voila! Every need is met. Well, almost. You still have fixed record lengths. Not only can the record address be alphanumeric (with numbers and letters), but it may also be read sequentially in record address order: automatic sorting. The address of the record is usually called a key. Some systems allow identical keys, others don't, and still others inform of duplication but still allow it.

Why don't we always use ISAM files? Well, there are several reasons. The most obvious is simply that Commodore doesn't have it. Secondly, we can simulate this capability with two files, a key file and a record file, with the key file in memory for manipulation and the data file on the disk. A rather obvious reason not to use ISAM files is that in many circumstances they are really not appropriate. Another reason they are often not used is that people are not aware that Commodore and other outside vendors have such a capability available as an add-on program.

Commodore's ISAM is called CMAR. I think that the very best one is 'The Master' from Canadian Micro, since it not only gives ISAM capability, but also provides screen layouts, security, high precision math, and much more. Another excellent one is, I think, no longer available, but was from Paul Zuzello at Creative Software. There have been some others. Many have been colossal failures, and each one usually has some limitation(s). Why the makers of microcomputers have not given this capability as standard equipment firmware, I don't know, It seems that the first to do so will score a major market triumph, from a programming point of view.

A lot has been presented about files. Next installment I will give some actual examples of the ideas presented here, and then put it all together in a random access program to store student grades. Until then, I pray that the new year will represent more than a renewal of old broken resolutions, but will be a time of renewal of mind, body and spirit. "Be not conformed to the world, but be transformed by the reNEWing of your mind . . . . " The best of New Years to each of you!

TALK OR SING—The "64" responds

IN YOUR OWN VOICE

with this new and unique development in Digital Recording

Enter up to 150 of your own words and phrases. Compute response with BASIC. Store word sets on tape or disk for unlimited selections. Easy for anyone to set up and use. Complete with cassette software (transferrable to disk) with demonstration programs for a talking clock, calculator, and black jack. How to define every key as a spoken phrase or song note or other sound. There are so many applications and special effects it boggles the mind! Also money making opportunities. Soon available for other popular computers. Software for word recognition being developed.

VOICE MASTER ONLY $119.95

complete with software and detailed manual.
Users kept up to date with Newsletter.

WE CAN DEMONSTRATE OVER THE TELEPHONE!!

COVOX CO. 675-D Conger St. Eugene, Oregon 97402
Tel: (503) 342-1271, Telex 706017
Check, money order, or VISA/MC
(Dealer inquiries invited)

Circle No. 170

Data Organization for the VIC-20: Part III

By Arthur J. Dudley

Last month's article ended with a problem concerning floating point real numbers. You were given the information below and asked to provide the variable name and its value.

Byte #1 . . . . . 65 Variable name
Byte #2 65
Byte #3 . . . . 135 Exponent
Byte #4 . . . . 200 MSB
Byte #5 63
Byte #6 . . . . . 46 Mantissa
Byte #7 . . . . . 73 LSB

Variable names for floating point reals are represented by straight ASCII code (no modification is performed); therefore, the number 65 represents the character "A" on the ASCII chart. Since bytes one and two both contain the number 65, the variable name is AA.

To determine the actual value represented by bytes #3 through #7, it is best to use the five steps covered in Part II of this series.

Step: 1: Convert the mantissa into its binary configuration. (See Figure 1)

Step 2: Number each bit from 1 to 32. (See Figure 1)

Step 3: At this point using the mantissa conversion program will simplify calculations (see Part II).

Program Instructions:

a) Enter the number 15 for the amount of bits set to one. Remember *not* to include the first bit.

b) One at a time, enter each bit number, *not* including the first bit, that is set to one. (2, 5, 11, 12, 13, 14, 15, 16, 19, 21, 22, 23, 26, 29, and 32)

The mantissa should have the value of .782214063.

Manual equation:

$\frac{1}{2}^{1}$(implied) + $\frac{1}{2}^{2}$ + $\frac{1}{2}^{5}$ + $\frac{1}{2}^{11}$ + $\frac{1}{2}^{12}$ + $\frac{1}{2}^{13}$ + $\frac{1}{2}^{14}$ + $\frac{1}{2}^{15}$ + $\frac{1}{2}^{16}$ + $\frac{1}{2}^{19}$ + $\frac{1}{2}^{21}$ + $\frac{1}{2}^{22}$ + $\frac{1}{2}^{23}$ + $\frac{1}{2}^{26}$ + $\frac{1}{2}^{29}$ + $\frac{1}{2}^{32}$ = .782214063.

Figure 1

Byte no.		Binary Configuration								Decimal Equivalent
4		1	1	0	0	1	0	0	0	200 (MSB)
	Bit#	1	2	3	4	5	6	7	8	
5		0	0	1	1	1	1	1	1	63
	Bit#	9	10	11	12	13	14	15	16	
6		0	0	1	0	1	1	1	0	46
	Bit#	17	18	19	20	21	22	23	24	
7		0	1	0	0	1	0	0	1	73 (LSB)
	Bit#	25	26	27	28	29	30	31	32	

Step 4: Subtract the number 128 from the contents of byte three to obtain the true exponent.

135 − 128 = 7 ← True Exponent
↑ Byte #3

Step 5: Multiply the fraction obtained in step three by the number 2 raised to the true exponent.

Determined in step 4
.782214063 × 2^{7} = 100.1234
↑ Determined in step 3

Because the leftmost bit of our MSB (Byte #4) is set to one, the value must be negative.

Variable AA = −100.1234

So far, I have covered integers and floating point real numbers. What remains are string variables. Before you continue reading, LOAD and RUN your memory dump program. After entering your name, press the SPACE BAR once to display the contents of memory locations 4923 through 4929.

String variables occupy a total of seven bytes in memory, the same amount occupied by integers and floating point reals (refer to Figure 2). Bytes one and two are used to represent the variable name. The first character is represented by straight ASCII code; the second character has the number 128 added to the ASCII code representation. Referring to Figure 2, you will see the letter "E" represented by the number 69 (ASCII code), and the null character represented by the number 128 (ASCII code for a null character + 128 = 128). Bytes six and seven are not used, leaving bytes three, four, and five to store the string. You might wonder how three bytes can store a string of more than three characters. The answer is, they cannot. Instead of storing the string itself, bytes three through five store the string's length and the address where the string is actually stored.

Byte three stores the string length (string E$ = "XX" is two characters in length), and bytes four and five store the actual address. Byte number four (LSB) represents the "units" or "ones" of an address, byte number five (MSB) represents multiples of 256. An MSB of 16 and an LSB of 90 represents an address of 4186 [(16 × 256) + 90.] The
↑ MSB ↑ LSB

largest address which can be represented by this technique is 65535 [(255 × 256) + 255], and the largest string possible is 255 characters. Since a program line cannot exceed 88 characters in length, you must

use the process of concatenation ("adding to") to circumvent this limitation. (Refer to your Programmer's Reference Guide for information on concatenation.)

To display the contents of address 4186, press the "J" Key on your keyboard. You should then see a prompt requesting an address to be entered. Type 4186 and press RETURN. You may have noticed address 4186 is in the program section of memory (refer to Figure 1 of the first article). The statement E$ = "XX", located in line 6 of the memory dump program, begins at address 4182, with the string stored at addresses 4186 and 4187 (refer to Figure 3).

String assignments via INPUT statements are handled a little differently. Since they are not inherent to the program, the VIC must reserve a section for them in memory. This section is located at the bottom portion of user RAM. For a 5K VIC, the end of user RAM is at address 7679. The first string assignment will be located at the bottom of user RAM and each consecutive string input will be placed on top of the previous one.

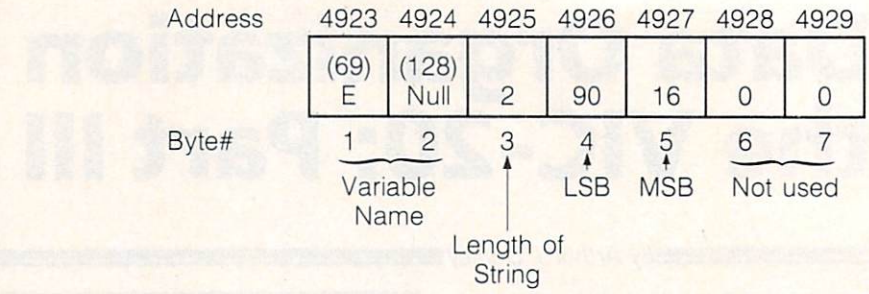
Figure 4 shows the configuration of the variable NA$. This variable will contain your name as input at the beginning of the program. The length and contents of this string will vary depending on your input. Using my name as an example, the string length (byte #3) is 9, with the string being stored at address 7671 [(29 × 256) + 247].

This completes the section on string variables, but before concluding, a few practical uses for the memory dump program are in order. The first and most obvious is program debugging; however, the memory dump program should be customized as follows prior to its use:

1. Eliminate lines 5, 6, 7 and 8. These lines are used to set up test variables and are not needed for program execution.
2. Renumber the memory dump program so as not to interfere with your main program. It is best to use the memory dump program as a subroutine and branch to it when necessary.
3 After your main program has been executed, and you wish to check memory variables, branch to your memory dump subroutine with a GOTO keyword. Do *not* use a RUN keyword for this will clear all your variables prior to execution.
4. You may wish to conserve memory by condensing the memory dump program by using multiple statement lines.

The next article in this series will include an append program to facilitate merging the memory dump program with your main program, and a customized memory

Figure 2: E$ = "XX"



The string variable E$ as shown on the screen display:

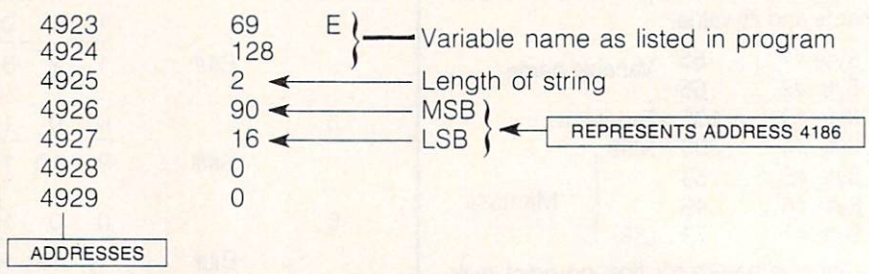
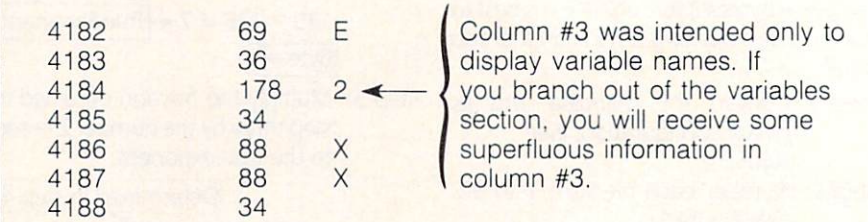


Figure 3: Statement E$ = "XX"

Note: To obtain the below display, press J on your keyboard and enter address number 4182.


4182 69 E
4183 36
4184 178 2
4185 34
4186 88 X
4187 88 X
4188 34
Column #3 was intended only to display variable names. If you branch out of the variables section, you will receive some superfluous information in column #3.

Program instruction breakdown:

Decimal Representation	Program Statement	Chart*
69	E	ASCII (pg. 272)
36	$	ASCII (pg. 272)
178	=	Program Tokens (pg. 178)
34	"	ASCII (pg. 272)
88	X	ASCII (pg. 272)
88	X	ASCII (pg. 272)
34	"	ASCII (pg. 272)

*The program section uses two sets of codes, ASCII and program tokens. The Chart column refers you to the proper conversion chart in your Programmers Reference Guide.

dump program. To gain familiarity with the memory dump program, try the following exercise.

1. Enter the additions below to the memory dump program *exactly* as shown:

```
1 X=296:Y=98:Z=INT((X/Y)*
  100+.5)/100:PRINTX;"/";Y;"=";
2 INPUTA
3 IFA=ZPRINT"CORRECT":END
4 PRINT"INCORRECT":END
```

   The above program is a simple division program. You are required to input the answer to 296 divided by 98.
2. Enter RUN
3. Enter the answer rounded to two decimal places (3.02) and press RETURN.
4. The word "INCORRECT" should be displayed. Enter PRINT Z and RETURN then PRINT A and RETURN in the immediate/direct mode.
5. If both variables have the value of 3.02, why then is the condition in line 3 false, thus preventing the word "CORRECT" from being displayed? (The answer will be in the next installment.)

   Note: To determine the cause, utilize the memory dump program to inspect the variables in question. Enter GOTO 7 to execute the memory dump program.

Finally, I'd like to mention two other uses for the memory dump program. They are (1) to easily obtain a listing of all variables for documentation purposes, and (2) to explore VIC's memory. You can display any address with this program.

Next time, I will explain how the three types of variables are used in arrays and point out some memory-saving techniques. The next article will conclude this series. So if you have any questions, please write to me through *COMMANDER* magazine.

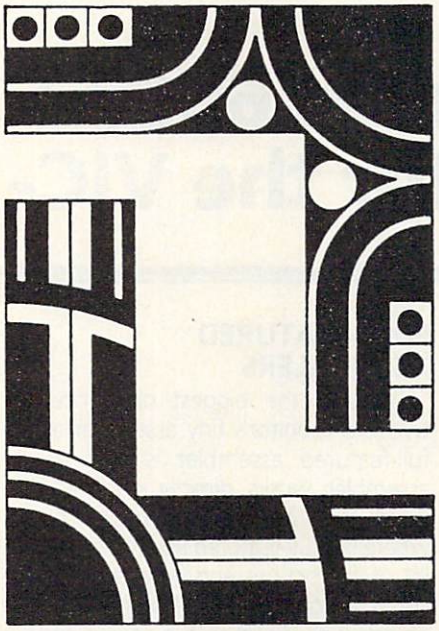


Figure 4: NA$ = "A. DUDLEY" (Keyboard input)

Note: To obtain your display, press R (returns you to the beginning of the variables section) and then press the SPACE BAR twice.

4937	78	N } Variable name
4938	193	A } Variable name
4939	9	← Length of string
4940	247	← LSB
4941	29	← MSB
4942	0	
4943	0	

Note: To branch to the string section of memory, press the S Key or determine the actual string address from bytes 4 and 5 and enter this address after pressing the J Key. Once accomplished, you should see a display with your name spelled out in the right hand column.

7671	65	A
7672	46	
7673	32	
7674	68	D
7675	85	U
7676	68	D
7677	76	L
7678	69	E
7679 *	89	Y

* End of user available ram for a 5K VIC.

VIC 20 C64

1983 TAX RETURN HELPER

Fast and easy income tax preparation.

- Form 1040 and Schedules A,B,C,D,E
- Enter and modify data on a screen copy of the form.
- Works like a spreadsheet - all the lines affected by a change are instantly updated.
- Form 1040 and Schedule A are automatically corelated.
- Price is **tax deductible.** Cassette $23 Disc $33 (+ $1.50 shipping & handling). Specify VIC 20 (16K RAM) or C64.
- Check, MO or credit card.

KSOFT CO.
845 WELLNER RD.
NAPERVILLE, IL 60540
(312) 961-1250
Circle No. 214
Dealer inquiries welcome

YORK 10™ CASSETTES

DATA TRAC BLANK CASSETTES

C-05, C-06, C-10, C-12, C-20, C-24, C-30

From the leading supplier of Computer Cassettes, new, longer length C-12's (6 minutes per side) provide the extra few feet needed for some 16K programs.
BASF-LHD (DPS) world standard tape.
Premium 5 screw shell with leader.
Error Free • Money back guarantee.

Call: 213/700-0330 for IMMEDIATE SHIPMENT on Credit Card Orders
ORDER NOW...MAIL TO... YORK 10™ 9525 Vassar Ave. #C3 Chatsworth, CA 91311

ORDER FORM

ITEM	1 DOZ.	2 DOZ.	TOTAL
C-05	7.00	13.00	
C-06	7.00	13.00	
C-10	7.50	14.00	
C-12	7.50	14.00	
C-20	9.00	17.00	
C-24	9.00	17.00	
C-32	11.00	21.00	
Hard Box	2.50	4.00	
SUB TOTAL			
Calif. residents add sales tax			
Shipping/handling (any quantity)			3.50
Outside 48 States, ADD $1 per doz. cassettes or boxes			
TOTAL			

500 C-12's 38¢ea. #C3
or C-10's ...
w/labels, add 4¢ ea
/shipping $17

FREE 1 STORAGE CADDY with every 4 doz. cassettes purchased.

Each cassette includes 2 labels only. Boxes sold separately. In Cont. U.S. shipment by U.P.S. If Parcel Post preferred, check here. ☐

Check or M.O. enclosed ☐ Send Quantity Discounts ☐
Charge to credit card: VISA ☐ MASTERCARD ☐

Card No. _____ Exp. _____
Name _____
Address _____
City _____ State/Zip _____
Signature _____ Phone _____
Computer make & model _____ Disk? (y/n) _____

Circle No. 225

Review of MOSES:

A Full-Featured 65C02 Assembler for the VIC-20

By Glen Colbert

A strange thing has been going on at my house since I started contributing articles to the local user's group newsletter. At all hours of the day (and night) strange calls come in. The people on the other end of the line seem to be suffering from great agony and frustration. "It goes out to the disk, but I can't get it back," is a common refrain. "Why didn't it work?" seems to have replaced "What is the meaning of life?" as the world's most difficult question.

At 10:30 one Sunday night, I received a call from one of these poor, agonized wretches. It seems that he was writing a terminal program for his new auto dial/auto answer modem. "It works great except I need to add a timing loop from $31E0 to $31F2 and there isn't any room. How can I move everything up 18 bytes without rewriting the whole program?" When I asked what assembler he was using, the problem became quite clear. He had taken on a large project with the tiny assembler provided in his monitors.

Tiny assemblers like those provided in machine language monitor (e.g., VICMON or HESMON) are fine for jobs which are smaller than, say, 100 bytes, but anything larger (particularly if it might require changes later on) really needs a "full featured" assembler. A tiny assembler's primary role is to make small changes in existing code as an aid to debugging machine language programs. References made with a tiny assembler must be made to a specific address (i.e., the use of labels is not supported), and operands cannot contain calculations. Also, there is no provision in most tiny assemblers for entering ASCII data without first converting it to hexadecimal.

FULL-FEATURED ASSEMBLERS

Probably the biggest difference between a monitor's tiny assembler and a full-featured assembler is that a tiny assembler works directly on the code which is to be executed (object code), whereas a full-featured assembler keeps a list of instructions and addresses (source code) which are later "assembled" into object code. Because the source code is not directly executed, it can contain information which is not intended to run, such as comments and labels. At assembly time, this "extra" information is either converted into numbers in the object code or ignored. The source code can be saved, and later loaded, without losing the comments, label names, and other information that makes assembly language a little bit easier. The source file can be edited, expanded, or modified with relative ease. If you need to insert some code into the middle of the program, no problem. Just load the source file, insert as much (or as little) as you like, and re-assemble the program. So long as you have used labels consistently throughout the program, no further modification is needed. The new code is ready to run.

Do you really need a full-featured assembler? I have a computer technician friend who uses VICMON for all of his 6502 assembly. However, I think that if you value your sanity, a good, full-featured assembler is a must for getting into machine language programming.

MOSES

Since I bought my VIC-20, I have tried out three commercially available 6502 assemblers: Develop 20 from French Silk, 6502 Professional Development System from Human Engineered Software, and Moses from Century Micro. Although this is primarily a review of the Moses assembler, I will make occasional comparisons to the other two assemblers.

NCR 65C02A

Included with the Moses package is a new microprocessor for your VIC. The new CPU must be installed before Moses will run. The 6502 inside your VIC is socketed (like a wall plug with 40 slots) so there is no need to pull out your soldering iron. Just open up the VIC, remove the old chip, and plug in the new one.

A few cautions are in order here. First, if your warranty is still in effect, this modification will void it. Second, the NCR 65C02 is a CMOS (Complementary Metal Oxide Semiconductor) chip. As such it is *very* sensitive to static electricity until you get it installed. I strongly recommend that you properly ground yourself while doing the installation. If you are at all unsure of how to do this, have a service technician install the new chip for you. Third, make sure that all the legs of the chip get into the proper holes in the socket and that the chip is properly oriented. Double check your installation before closing the VIC back up.

CMOS ADVANTAGES

CMOS chips use significantly less power than conventional 6502 (NMOS) chips. While the NMOS chip draws 400ma the new chip draws only 8ma. This may reduce some of the heat buildup in the VIC.

The 65C02A is more "crash resistant" than the 6502. Not all code numbers

represent valid instructions to the microprocessor. These invalid instructions are called "unimplemented opcodes". With the 6502, some of these unimplemented opcodes cause the machine to "hang up" when one is encountered. The VIC would have to be turned off or reset to recover from it. The CMOS version treats these as NOPs (no operations) thus making it easier to recover from program errors. Additionally, the CMOS version is more "noise resistant" than the old chip.

The most significant difference between these two chips is the addition of 27 new opcodes in the CMOS version (see Table 1). Most of these are useful enough that they soon become a necessity to the programmer. All of them can result in a reduction in program size. Storing the registers gives a good example of this.

```
        6502                65C02
        STA TEMP            PHX
        TYA                 PHY
        PHA           PROCESS
        TXA                 PLY
        PHA                 PLX
        LDA TEMP
PROCESS
        STA TEMP
        PLA
        TAX
        PLA
        TAY
        LDA TEMP
```

It should be noted at this point that there is another 65C02 microprocessor presently available. This other chip, made by Rockwell, has still more commands. Either one should run code written on Moses, but Moses only supports the NCR version's opcodes.

Existing programs written for the standard NMOS 6502 run without modification on the new microprocessors. Additionally, the documentation that comes with Moses has the NCR data sheet for the new chip.

GETTING STARTED

Moses comes in a cartridge. While it is located in high memory ($A000-$BFFF), it is not an "auto start" program. This is particularly handy if you don't like the idea of wearing out your expansion port's edge card connector by constantly plugging and unplugging cartridges. It is written (100%) in machine language. This is a refreshing change from my experiences with the HES and French Silk assemblers, which are mostly in BASIC. Not only does Moses assemble code faster, but it is also quite a bit more difficult to "crash" by an input error.

THE EDITOR

The editor is the part of the program that controls the input, modification, and deletion code. In Moses, the editor checks the syntax of all entries. If any errors are detected, the line is ignored and an error message is displayed. It can not, of course, check for missing labels, branches which are too long, or duplicate labels. These errors are found only at assembly time.

Except when code is being entered, the command menu is always on the screen. The menu options are:

I)nsert	X)it
D)elete	B)asic
M)odify	R)eset
P)rint	T)able
A)ssemble	N)ew

Individual instructions (i.e., [label] opcode [operand]) are identified by the editor with the use of "line numbers." Commands from the menu that are used to edit the source file make reference to these line numbers. For example, to add a timing loop into the source code at line 125, one would type "I 125 (return)" from the menu. This puts Moses in the insert mode, and whatever is entered is placed between the old line numbers 124 and 125. Enter as much code as you like and Moses will move everything else back to make room for it. Type the left arrow and press return and you are back at the menu. The command "D 5" will delete line #5 and move everything else up to fill in the space. "D 5,10" would delete lines five through ten. The syntax for print, modify, and delete are identical. If (I)nsert is selected without a line number, all subsequent code will be added to the end of the file.

Moses stores the source code in an intermediate form. This reduces the amount of memory that it takes up as well as reducing the time for loading and saving. It is also one of the reasons that Moses can assemble the code as fast as it does. Some of the assembly is done as the code is input.

LIMITATIONS

Unfortunately, nothing in life is perfect. Moses has some flaws. I would like to get them out of the way now because, I feel, they are far outweighed by the good points. The likely reason for them is that the whole package had to fit into an 8K ROM.

An observant reader may have noticed the absence of save and/or load functions in the menu. The monitor must be used for saving or loading source code files. The start and end addresses of the file can be obtained with the editor's (R)eset command. Then the monitor is entered through the (X)it command and the block of memory which contains the source code is saved (or loaded). This is a rather awkward way of going about things, but it does have at least one advantage. The load and save times are much faster (particularly with tape) than the sequential method used by French Silk and HES.

The machine language monitor that comes with Moses is one of my favorites, Micromon by Bill Yee. It has been modified to integrate better with Moses, but there are still two problems. First, its disassembler doesn't support the new opcodes. I've been told that this is being worked on and should be corrected soon. Second, while the screen display has been improved, it still doesn't have the neat appearance of HESMON. Those of you who have used other monitors will have to spend a little time relearning the particular syntax of this one.

Unlike other 6502 assemblers that I am familiar with, Moses does not generate a printed listing of the code as it is assembled. However, as I stated before, Moses is fast (about 250 lines per second). Waiting on a printer would slow it down dramatically. A printed listing of the source code can be made by exiting to BASIC (B command), opening the printer as the command output device (OPEN4,4:CMD4:SYS40965) and then typing P (print) to print the source file and/or T (table) to print the label table and its values. (There is a slight bug in the program here. When the output is diverted to the printer, all commands must be preceded by a space.)

It is up to the programmer to allocate memory when using Moses. The storage areas for the source code, label table, and object code have to be reset (R command) if the object file is going to be any larger than 511 bytes. It is only fair to point out that this is not an uncommon requirement with assemblers which assemble directly into memory, and that the method used here is easier than that used with the HES assembler.

I would have really liked to have seen an option to assemble directly into a disk program file. This would have made memory management much easier, at least for programmers using disk-based systems.

CO-RESIDENT EDITOR/ ASSEMBLER/MONITOR

The first major advantage that Moses has over the other VIC-20 assemblers that I have used is that it has a co-resident editor/assembler/monitor (available as an option on Develop 20). In anything to do with computers, the error state is the normal state. Having all of the necessary tools together would make no difference to a programmer who always gets things right the first time (but I have yet to meet Him). A lot of time in machine language pro-

(716) 637-6371
FABTRONICS
51 Quarry St., Dept. C, Brockport, N.Y. 14420
VIC-20/C-64 Reg. T.M. Commodore Business Mach., Inc.

***ENERGY MASTER** *20 (+3K)/C-64 T $24.95/D $27.95*
Keep track of all your utility costs. A highly versatile program to calculate amounts used and costs. Also gives averages, estimates, future costs and checks your bill.

***TENANT FILE** *20/64...T $17.95 D $20.95*
Maintain a comprehensive data record on each tenant.

***RENTAL MANAGER** *C-64 T $24.95 D $27.95*
Spreadsheet data records for any rental application

***FILL-A-FORM** *C-64...T $16.95/D $19.95*
Numerous selection of business/home forms. You fill in the blanks.

***FAB MAIL** *20/C-64...T $16.95/D $19.95*
A super user friendly mailing list with features others wish they had thought of.

***FAB BUSINESS** *C-64...D $37.95*
A mail order or small business must. Easy invoice/packing list/label all in one. Supports charge card data and allows quick selection of items from an inventory database. Plain paper or selected commercial forms.

SAVE Snakman-Skramble-Gridder-Pinball Wizard (20) 20...T $12.95/D $14.95 64...T $17.95/D $19.95

20/64	Print Interface (Cardco)		**$39.96**
20/64	Rabbit (2.2 Version)		**$36.96**
64	Totl Infomaster	D	**$38.96**
64	5 Slot Exp. Board (Cardco)		**$58.96**
64	S.A.M. (Soft/Speech)	D	**$54.96**
64	Q Bopper..(3D Arcade)	D	**$28.96**
64	Easy Script. (Comm)	D	**$36.57**
64	Accounts RCV. (Comm)	D	**$36.57**
20/64	Numeric Keypad (Cardco)		**$34.96**
64	Totl Text...T $29.96	D	**$33.96**
64	Totl Speller	D	**$29.96**
64	Typing Strategy	T/D	**$27.96**
64	Totl Business...T $72.96	D	**$75.96**
64	Accounts Pay (Comm)	D	**$36.57**
64	General Ledger (Comm)	D	**$36.57**

S & H $2.50 First Item $1.00 ea. added item · All prices U.S. funds C.O.D. (Cash/Cert) U.S. only add $1.75 · N.Y. add sales tax
We accept MasterCharge or VISA
Circle No. 40

SUPER SOFTWARE SPECIALS!
FOR COMMODORE 64

GAMES		LIST	SPECIAL
Buck Rogers	X	39.95	28.56
Castle Wolfenstein	D	29.95	21.66
Chess (Odesta)	D	69.95	50.76
Choplifter	X	39.95	28.56
Combat Leader	D	39.95	28.56
Computer Baseball	D	39.95	28.56
Congo Bongo	X	39.95	28.56
Defender (Atarisoft)	X	44.95	38.19
Dig Dug (Atarisoft)	X	44.95	38.19
Exodus (Ultima III)	D	54.95	39.66
Flight Simulator II	D	49.95	38.96
Frogger	D,C	34.95	24.86
Infidel	D	49.95	35.96
Jumpman Jr.	X	40.00	28.56
Lode Runner	D	34.95	24.86
Moon Shuttle	D	29.95	21.66
Pitstop	X	40.00	28.56
Popeye	X	49.95	35.96
Pooyan	D	29.95	21.66
Protector II	D,C	34.95	24.86
Q-Bert	X	49.95	35.96
Quest For Tires	D	34.95	24.86
Ringside Seat	D	39.95	28.56
Sargon II	D,C	34.95	24.86
Shamus-case II	D,C	34.95	24.86
Star Cross	D	39.95	28.56
Star Trek	X	39.95	28.56
Suspended	D	49.95	35.96
Temple of Apshai	C,D	40.00	28.56
Zork 1, 2, or 3	D	39.95	28.56

EDUCATIONAL		LIST	SPECIAL
Alligator Mix	X	34.00	24.16
Alphabet Zoo	X	34.95	24.86
Delta Drawing	X	39.95	28.56
Dungeon of Algebra Dragon	D,C	24.95	17.96
Master Type	D	39.95	28.56
Math Blaster!	D	49.95	35.96
Speed Reader II	D	69.95	50.76
Typing Tutor/Word Invaders	D	24.95	17.96
Word Attack!	D	49.95	35.96
BUSINESS			
Bank Street Writer	D	69.95	50.76
Homeword	D		please call
Home Accountant	D	74.95	54.46
Multiplan	D	99.95	71.96
Paper Clip	D	125.00	90.46
Practicalc 64	D	54.95	39.66
Script 64	D	99.95	71.96
Wordpro 3+/and Spellright	D	99.95	71.96
HARDWARE			
Hes Modem		69.95	50.76
Koala Pad		99.95	71.96
Maxell Disks (10)		51.00	29.50

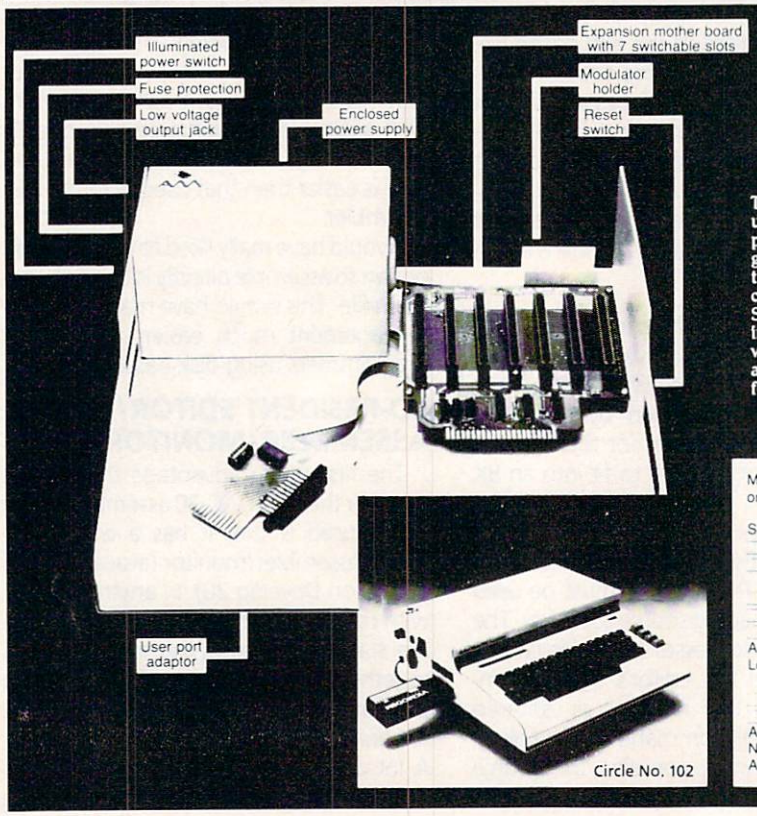
BYTES & PIECES

C.O.D. • M.O. • Cert. Checks • School P.O. • VISA • MasterCard • Checks Allow 2 Weeks • N.Y.S. Res. Add Sales Tax • US Orders Under $150. Add $2.00 P & H • All Canadian, US Funds $3.00 P & H • Foreign, Charges Only, Min. P & H $7.00

Ask for FREE price list
Educators: ask for special educational catalog

Box 525, Dept. 30
East Setauket, N.Y. 11733
(516) 751-2535
Circle No. 50

New VIC Superchassis II



The new VIC Superchassis II from Arfon Micro is the ultimate expansion for your VIC-20. Make one neat package of your VIC-20, memory expansion cartridges, game cartridges, interfaces, modem, and monitor with the only complete expansion unit available. Soundly constructed from heavy gauge aluminum, the Superchassis II maintains the electrical and mechanical integrity of the expanded VIC. Now at a new lower price with optional expansion port switching and modem adaptor, the Superchassis II is everything you've asked for to enhance your VIC-20.

Mail to: Arfon Micro, 111 Rena Dr., Lafayette, LA 70503
or phone: 318-988-2489

Send me: (check your choice)
- ☐ Arfon Superchassis II @ $99.95 _____
- ☐ User port board with switch bank, modem hookup, & reset button @ $29.95 (Installed free) _____
- ☐ Heavy duty aluminum cover shelf @ $9.95 _____
- ☐ 8K Ram Cartridge @ $39.95 _____
- ☐ 16K Ram Cartridge @ $79.95 _____

Add $5.00 shipping for Chassis or $1.50 for Ram Cartridge _____
Louisiana Residents add 5% Sales Tax _____
Total _____

☐ Payment enclosed
☐ Charge to ☐ MasterCard ☐ American Express
Acct. No. _____ Exp. date _____
Name _____ Telephone _____
Address _____ City, State, Zip _____

Circle No. 102

gramming is spent making small changes to the code (e.g., forgot the # in LDA #$00). If an error is made and the editor and assembler aren't co-resident, a long, drawn out correction process must take place. First, the editor has to be loaded, then the source file. After this the modifications can be made and the source code (and sometimes an intermediate file) can be rewritten to the disk or tape. Then the assembler can be loaded, the source file re-assembled, and the hunt for bugs can continue.

With Moses, however, I have found that with small programs I can have not only the editor, assembler, and the monitor in RAM, but the source and object code as well! Minor changes (or even major ones) can be made immediately to the source and, just as fast, re-assembled. The advantage of doing it this way is not only a great savings in time, but the source code always remains true to the object code. I can't stress too strongly how much of an advantage I think this is–particularly for someone who is just starting out with machine language.

THREE-PASS ASSEMBLER

Moses is a three-pass assembler. Develop 20 is a two-pass assembler, and the HES assembler is a one-pass that can be modified to make two passes. The number of passes is the number of times that the assembler goes through the source code looking for information. Generally, the greater the number of passes, the more forgiving the assembler is when it comes to defining information within the code. For example, the HES assembler (in its one-pass configuration) cannot process a label which has not yet been assembled.

With Develop 20, a two-pass assembler, forward references to labels work fine, but labels that are defined by the EQU pseudo op can only be used after the label has been defined. A problem with this approach is that if something is overlooked until it comes time to code it, the programmer must remember to go back and enter it into the equates area of the source code

TABLE 1

Assembly Language Functions Unique To NCR 65C02 Chip

NEW INSTRUCTION MNEMONICS

HEX	MNEMONIC	DESCRIPTION
80	BRA	Branch relative always (Relative)
3A	DEA	Decrement accumulator (Accum)
1A	INA	Increment accumulator (Accum)
DA	PHX	Push X on stack (Implied)
5A	PHY	Push Y on stack (Implied)
FA	PLX	Pull X from stack (Implied)
7A	PLY	Pull Y from stack (Implied)
9C	STZ	Store zero (Absolute)
9E	STZ	Store zero (ABS, X)
64	STZ	Store zero (Zero page)
74	STZ	Store zero (ZPG, X)
1C	TRB	Test & reset memory bits with accumulator (Absolute)
14	TRB	Test & reset memory bits with accumulator (Zero page)
0C	TSB	Test and set memory bits with accumulator (Absolute)
04	TSB	Test & set memory bits with accumulator (Zero page)
89	BIT	Test Immediate with accumulator (IMMEDIATE)

ADDITIONAL INSTRUCTION ADDRESSING MODES

HEX	MNEMONIC	DESCRIPTION
72	ADC	Add memory to accumulator with carry [(ZPG)]
32	AND	"AND" memory with accumulator [(ZPG)]
3C	BIT	Test memory bits with accumulator (ABS, X)
34	BIT	Test memory bits with accumulator (ZPG, X)
D2	CMP	Compare memory and accumulator [(ZPG)]
52	EOR	"Exclusive Or" memory with accumulator [(ZPG)]
7C	JMP	Jump (New addressing mode) [ABS(IND,X)]
B2	LDA	Load accumulator with memory [(ZPG)]
12	ORA	"OR" memory with accumulator [(ZPG)]
F2	SBC	Subtract memory from accumulator with borrow [(ZPG)]
92	STA	Store accumulator in memory [(ZPG)]

© 1982 by NCR Corporation

C-64™ SOFTWARE

Prowriter™ & NEC8023™
with
MW302™ or CARD/?™ interfaces

Have you had trouble making your printer do everything?

We have 6 Printer Programs with correct codes and an EVFU Program that works!
Programs are full of remarks.
User Guide with tables included.

only $14.95
(includes shipping & handling)
Send Check or M.O.

Specify TAPE or DISK

LOOP SOFTWARE
P. O. Box 748
Fairborn, Ohio 45324

Circle No. 209

HOW DO WE DO IT?

We're an electronics maufacturer selling direct to the public by mail order only. In this way we can truly offer quality and economy. All items are guaranteed. Documentation is extensive.

3 SLOT EXTENDER $25
Gold Contacts, Fuse, Reset Switch. (VIC)

CASSETTE INTERFACE $25
Save and Load on your recorder. (VIC & C64)

AUDIO/VIDEO BOX $15
Three independent outputs from your VIC: Low Level Audio (stereo, recorder, etc.), Video Monitor, and R.F. Modulator.

COMPUTER COVER $6
Protect your VIC or C64 from dust and spills. Gray, professional look.

All prices postage paid. Kansas residents add 3%. Money Order or Check only.

Obbligato
BOX 47398, WICHITA, KANSAS 67201

Circle No. 137

Intelligent Software For Commodore Computers

Copycalc is an affordable electronic spread-sheet which turns your video screen into a window on a matrix of numbers. Cursor around the matrix, enter numbers; the totals reflect the changes. You can save the matrix to disk or tape, or print it or your printer. For $20 ($15 with another program), this program might justify the cost of your computer. Requires 6k RAM; smaller version available for a standard VIC.

Word Processor Plus was not designed to be an expensive toy; it was designed solely to facilitate correspondence, for a wide range of personal and business uses, quickly and easily, with a minimum of training and frustration on the part of its user, and at the least possible cost, both in hardware and software. The most thoroughly tested, useable word processor available at anywhere near the price, $25; 10k RAM, printer req'd.; RS-232C version available for VIC and 64.

Also available: **Baseball Manager,** a sports-documentation program; and **Inventory,** a perpetual inventory control program for a small retail business (various reports, multiple vendors); $30 each; 10k RAM req'd., printer suggested.

All programs will load and run on any Commodore computer; all support tape, disk, and printer.

Prices include documentation and shipping; Calif. residents add 6%. Please specify hardware configuration when ordering. Sorry, no games available.

William Robbins, Box 3745, San Rafael, CA 94912

Circle No. 21

or an error will be generated.

Moses, being a three-pass assembler, has none of these problems. However, while labels can be defined anywhere in the source, it is still good technique to keep them properly grouped together.

CONCISE PSEUDO OPS

The fact that Moses uses more pseudo ops than the other assemblers does not, in itself, make Moses better. For example, the EQU, ADR, OBJ, and DFS ops are replaced in Develop 20 by just one (EQU). However, while more opcodes have to be learned for Moses, their conciseness makes the code easier to follow.

I especially like the way that the DAT (BYT on the other two) pseudo op is installed with Moses. It will allow decimal, Hex, or ASCII data on the same line. For example:

```
12 MESSAG DAT 13,"HI THERE",$ØD,Ø
```

This makes it much easier to code messages which are to be printed, as well as a lot of other routine chores.

ADDRESSING MODES

All three of these assemblers support the standard addressing modes of the 65Ø2. However, there are two things that set Moses apart from the others. First, it is smart enough to tell when it should use the zero page addressing mode without the programmer having to specify it. In addition to the normal use of labels in the immediate addressing mode, Moses supports the immediate addressing of the high/low byte of a label.

DOCUMENTATION

The instruction manual that comes with Moses is above average for VIC documentation. It comes in a nice three-ring binder. There are three basic sections to the manual. The first is an explanation of the editor/assembler. It also has two lessons to help get the programmer familiar with the system. The second section is an explanation of the machine language monitor. This includes demonstrations and syntax examples of most of the monitor's commands. The third section is the appendices. It includes detailed illustrations of the usage, syntax, and features of the assembler. It also contains the data sheets for the new microprocessor as well as sample uses for some of the new opcodes.

The manual is not intended to be a guide to 65XX machine language programming. There are several good books out which adequately fill this need. With one of them in the right hand and the Moses manual in the other, you should have few problems getting down to the machine's level.

SUMMARY

Moses is everything that many people *thought* they were getting when they bought VICMON. It is well written and relatively easy to use. I wouldn't hesitate to recommend it to anyone who is thinking about getting into machine language. I strongly recommend it to those of you who are tired of growing grey while your program is being assembled. There is no doubt in my mind that Moses is fully worth its price. It even gives me time to answer those strange phone calls.

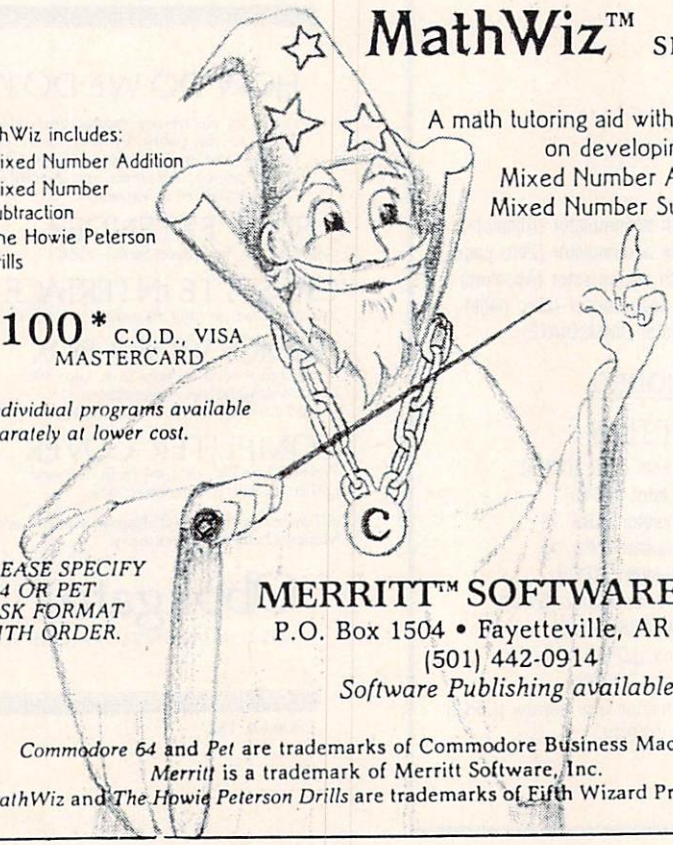
Product Name: MOSES,
The 65CØ2Assembler for the VIC-20

Manufacturer: Century Micro
1832 Tribute Road,
Suite 213
Sacramento, CA 98515
(916) 920-3656

Retail Price: $59.95 including cartridge, manual, and 65CØ2 chip.

[According to the manufacturer, versions of MOSES for the conventional VIC (65Ø2) with 8K expansion, and for the C-64 will be available on disk or tape for $39.95.]

Commodore™ software to make your child a Math Wizard:



MathWiz™ SERIES 1

A math tutoring aid with emphasis on developing skills in Mixed Number Addition & Mixed Number Subtraction.

MathWiz includes:
- Mixed Number Addition
- Mixed Number Subtraction
- The Howie Peterson Drills

Full color graphics & sound will thrill your child encourage learning

$100* C.O.D., VISA MASTERCARD

Individual programs available separately at lower cost.

PLEASE SPECIFY C64 OR PET DISK FORMAT WITH ORDER.

MERRITT™ SOFTWARE, Inc.
P.O. Box 1504 • Fayetteville, AR 72702
(501) 442-0914
Software Publishing available.

Commodore 64 and *Pet* are trademarks of Commodore Business Machines.
Merritt is a trademark of Merritt Software, Inc.
MathWiz and *The Howie Peterson Drills* are trademarks of Fifth Wizard Productions.

Circle No. 222

Business Software for the C-64

By William L. Simon, Ph.D.

"When the 64 was first announced, programmers thought it was just another game machine, and didn't pay much attention. But then, they started finding out that it's really a very powerful machine."

That's how one executive at a leading software house explains the flood of business products for the 64 now beginning to pour onto the market, some of them capable of giving the small or not-so-small business a computing capability that you would expect to find only in a much larger system.

But of course, this plethora of product brings with it a dilemma for the buyer. When there are so many competitive packages to choose among, what do you base your selection on? Often we don't even know the right questions to ask. One attractive word processing package will only single space; a very powerful accounting package requires you to input not one but *two* six-digit account codes for every check you enter.

What follows is a comparison of packages in three categories–word processing, data base, and (briefly considered) accounting–intended to help you narrow the field to the one or two packages of a particular type that sound closest to your needs. The comments are offered mainly for the Commodore 64 owner who is running a small business or a part-time business from the home.

The information will also be helpful to anyone looking for software for handling personal chores (letter writing, home bookkeeping, etc.) Whatever your need, you should ask your dealer to let you try the software before deciding, to be sure it really answers your requirements. If you have dealers as helpful as mine they'll be glad to cooperate as their time permits.

WORD PROCESSING

NOTE: Unless otherwise mentioned, the software included here offers the features expected in the more powerful word processing packages–page numbering; headers and footers; underlining; italics and bold (when used with a printer that supports these functions); mail merge (which permits you to send individualized letters to a list of addressees); and full editing capabilities including insert, delete, block move, and global search/replace.

Also note: if you will want to use special characters and functions such as italics, superscripts, expanded print, or ASCII characters not on the keyboard, you should insist that your dealer demonstrate that the software/printer combination you have in mind will produce them easily. While the better software can support these functions, and many dot-matrix printers can provide them, the particular combination you have in mind may not be very good partners. The fine Gemini 10 printer on the system I use balks when asked for italics, bold or the like; with one software package, the printer requires nine (!) control strokes to provide each superscript numeral.

WordPro 3 Plus

(Professional Software Inc.: $89.95)

WordPro reached the market well ahead of most other word processing packages for the 64, based on their earlier versions for other Commodore systems, and WordPro 3 has become the standard against which other offerings tend to be measured.

The 125-page User's Guide is thorough, well organized and easy to use, complete with a table of contents and an index.

WordPro 3 is probably not the best package, however, for any office where a number of different people will be using the system, or where staff turnover requires that new users be trained with some frequency, since many of the operating procedures are not readily remembered. (Directory is called by pressing f7 and the zero key; a stored text is recalled by holding Shift and pressing Clear/Home, letter r, and the text name.) Although the Commodore provides eight function-key modes, WordPro 3 makes use of only two.

One other small annoyance: a series of questions on the peripheral equipment must be answered each time the software is loaded; there is no provision for storing the answers. (In fact, a short-cut procedure is sometime available–indicate your printer type and then press f7 for default answers to the other questions; this procedure was provided to me by PSI, and does not appear in the User's Guide.)

Overall, WordPro 3 is an admirable package, well worth considering.

Easy Script
(Commodore: $49.95)

Ditto most of the above: Easy Script and WordPro 3 Plus are twins–not identical but (to stick to the analogy) at least fraternal, even to the extent of using many of the same format commands (cn; to turn on centering; hd for heading format, etc.)

Both Easy Script and WordPro 3 Plus provide the capability of preparing individualized form letters from a mailing list, with the additional capability of inserting unique details in each letter (amount owed, time of an appointment, or the like).

Easy Script, however, provides a number of convenience features not found in its look-alike; among them: before printing a text, you can obtain a display on the screen that shows you where the page breaks will occur when you print it out. There are also a number of extra cursor control features (scan normal, scan fast, jump to end of text, etc.) And Easy Script makes a more extensive use of the function keys.

The User's Guide is well thought out, considerably better than average.

Though it will never earn high marks for convenience, for a full-capability word processing package, Easy Script will be hard to beat.

Script 64
(Computer Marketing: $139:95

Here's an eye-opener: word processing that includes a dictionary to check your spelling.

The dictionary, included at no extra cost, is in effect an empty container which you fill with words in the course of using the system. This will slow down your operation initially; and even when your dictionary is built up, you will find that a document of any appreciable length takes considerable time for the program to check, with the operator remaining at the terminal throughout the process to respond each time a word is flagged.

Other dictionary programs for the C-64 are becoming available; we're still waiting to see one that can meet demanding requirements.

The Script 64 operates on a different approach than the above programs. Instead of text scrolling as if on one very long piece of paper, each screen is treated separately, with the user having to give a specific command to move from one screen to the next. You may find this annoying, especially if you like to be able to look at what you've just written while you compose the next bit. But moving from screen to screen can be done very readily using the function keys, and the text is joined from one screen to another automatically when printing.

Three "Help" screens are provided (although you must reload the program disk to access them). Text is in some cases automatically saved to disk, a very desirable feature not found in other systems; (anyone who has ever lost the document he was working on, through forgetfulness, hitting the wrong key, or power failure, will appreciate the value of this.) Also, deleted material can sometimes be restored to the screen (another feature especially welcome to those who have ever had second thoughts after a deletion). Keys can be redefined, so that, for example, the "equals" sign is replaced by "n", or any other ASCII character supported by your printer. You can print out any screens you selected, rather than having to start your printing with the first screen of the text. You can global search/replace several different words or phrases simultaneously. And two common French characters (c and e) are directly available on the keyboard.

One major drawback of Script 64 is that, once a disk has a number of dif-

TELSTAR 64

Sophisticated Terminal Communications Cartridge for the 64.

PFO 10D 00D CP D1 D2 BELL 12:30:00 10:14:36
(TELSTAR's Status Line)

Don't settle for less than the best!

- Upload/Download to/from disk or tape.
- Automatic File Translation.
- Communicates in Industry Standard ASCII.
- Real-Time Clock plus Alarm Clock.
- Line editing capability allows correcting and resending long command lines.
- 9 Quick Read functions.
- Menu-driven.
- Similar to our famous STCP Terminal package.
- Works with Commodore Modems and supports auto-dialing.

The best feature is the price — **only $49.95** (Cartridge and Manual)

Machine Language Monitor Cartridge
for the CBM 64

More than 20 commands allow you to access the CBM 64's Microprocessors Registers and Memory Contents. Commands include assemble, disassemble, registers, memory, transfer, compare, plus many more.

Someday every CBM 64 owner will need a monitor such as this.

Cartridge and Manual — **$24.95**

Circle No. 14

8K in 30 Seconds
for your VIC 20 or CBM 64

If you own a VIC 20 or a CBM 64 and have been concerned about the high cost of a disk to store your programs on, worry yourself no longer. Now there's the RABBIT. The RABBIT comes in a cartridge, and at a much, much lower price than the average disk. And speed . . . this is one fast RABBIT. With the RABBIT you can load and store on your CBM datasette an 8K program in almost 30 seconds, compared to the current 3 minutes of a VIC 20 or CBM 64, almost as fast as the 1541 disk drive.

The RABBIT is easy to install, allows one to Append Basic Programs, works with or without Expansion Memory, and provides two data file modes. The RABBIT is not only fast but reliable.

(The Rabbit for the VIC 20 contains an expansion connector so you can simultaneously use your memory board, etc.)

$39.95

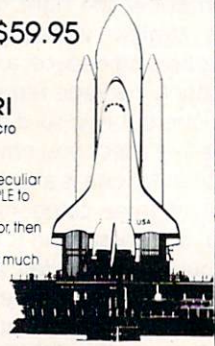
MAE NOW THE BEST FOR LESS! $59.95

For CBM 64, PET, APPLE, and ATARI

Now, you can have the same professionally designed Macro Assembler/Editor as used on Space Shuttle projects.

- Designed to improve Programmer Productivity.
- Similar syntax and commands - No need to relearn peculiar syntaxes and commands when you go from PET to APPLE to ATARI.
- Coresident Assembler/Editor - No need to load the Editor, then the Assembler, then the Editor, etc.
- Also includes Word Processor, Relocating Loader, and much more.
- Powerful Editor, Macros, Conditional and Interactive Assembly, and Auto - zero page addressing.

Still not convinced; send for our free spec sheet!



Eastern House

3239 Linda Dr.
Winston-Salem, N.C. 27106
(919) 924-2889 (919) 748-8446
Send for free catalog!

VISA
MasterCard

ferent items on it, you may find it difficult to locate the one you are seeking. The Directory is not created automatically as with other systems, but must be filled in manually; users who do not take the trouble to do this may find themselves playing hunt and seek throughout the disk's 999 screens.

Insta-Writer
(Cimmaron Corp.)

Yet another distinctly different approach, Insta-Writer is a 40-column software that indicates how the line-breaks will occur in a 60- or 80-column printout: on the display, the two lines that will produce a single printout line are highlighted separately.

Insta-Writer is handy in another way, as well: the program is on a plug-in chip, rather than on disk, so that it is ready to use the instant the computer is turned on.

Also unique: each time you finish entering a line, the text shifts, so that you are always looking at the same place on the screen; however, this feature makes it difficult to review more than a few lines of what has been written, so it is a drawback for anyone who composes at the keyboard (as opposed to a secretary who is simply typing rough copy provided to her).

A more severe drawback that makes this package usable in many applications is that *it will only print out single-spaced text;* it is not possible to double- or triple-space.

Menus for control commands (storing, printing, margins, etc.) are provided on screen, but many users will find the display contains so many "convenience" elements that it is distracting to work with. No merge, italics, bold, or page numbering is provided.

Copy-Writer
(Microtech)

If you'd like to be able to enter your text, and then have it printed out in two columns, ready for reproducing as a newsletter, manual or what-have-you, Copy-Writer will do it for you. In the two-column mode, the program counts characters before printing each page, determines where the column-ends should be, and then prints it all out in a single pass, in a smaller than usual typeface (which your printer must be capable of for this to work).

Another especially attractive feature: you do not have to go through the annoying process of giving your hardware parameters each time you start up. You go through the procedure once when first using the system, and do not have to repeat it unless you change some hardware. Also, the program, after being configured to your system, can be stored on your data disks, avoiding the business of having to swap disks after loading the program each time you start up the system.

People who do a lot of on-screen editing will admire Copy-Writer's Block Move feature, which is extremely simple to use, and quite fast–a good model that programmers of the other word-processing systems would do well to copy.

The system also makes good use of the function keys. Two caveats, one dealing with the correction of typing errors when inputting text, which is awkward; and the other with an unfortunate situation that the creators of this system should not have permitted to exist. It's covered by a warning in the manual that says–"If you have spent the entire day typing and you hit 'I', too bad . . . its gone." (The two grammatical errors in the single sentence are theirs, not ours.) Why the programmers couldn't have provided an "Are you sure?" or similar to avoid this situation may never be known, but it's enough to make one think twice about a purchase.

VIC-20 & 64

What *is* a Cheatsheet, anyway?

Leroy's Cheatsheet™ Keyboard overlays are durable plastic-coated templates. When simply laid on your VIC-20 and -64 keyboards, the **Leroy's Cheatsheet**™ surrounds the keys with essential information, placing your most valuable programming tool at your fingertips.

At **Leroy's Cheatsheet**™ we take the time to learn and use each program before designing a keyboard overlay. Not only are our overlays designed using easy to follow instructions and illustrations, but all commands are available and many extras are added to make programming easy and fun.

Our BASIC **Leroy's Cheatsheet**™ not only has all commands and functions, but also has device numbers, program list printing commands, disk commands, and many illustrative examples of the actual BASIC commands in the cutout.

Leroy's Cheatsheet™ overlays make it all easy for only $3.95.

Please send me the following Leroy's Cheatsheet™ keyboard overlays

20	64		20	64	
☐		Programmer's Aid[1]	☐	☐	Graphic printer (1515 & 1525)[1]
☐	☐	Vicmon[1]	☐		UMI Wordcraft 20
☐	☐	Super Expander[1]	☐		HES Vic Forth[2]
☐	☐	Vic Typewriter[1]	☐	☐	HES Writer[2]
☐		Victerm 1[1]		☐	Wordpro 3 plus
	☐	Term 64[1]		☐	Easy Script[1]
☐	☐	Quick Brown Fox	☐	☐	Basic

CO1283

Send check or money order plus $1.00 (postage and handling)
PA residents add 6% sales tax.

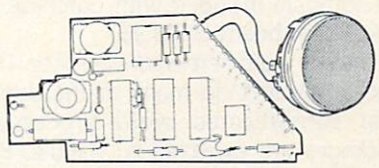
Name _____
Address _____
City _____ State _____ Zip _____

[1] Products of Commodore Business Machines, Inc. [2] Product of United Microware Industries, Inc.
[3] Products of Human Engineered Software. [4] is a Trademark of Commodore Business Machines, Inc.

CHEATSHEET PRODUCTS™
P.O. Box 8299 Pittsburgh PA. 15218 (412)456-7420

Circle No. 164

THE ULTIMATE LOCATING AND MEASUREMENT SYSTEM



ULTRASONIC "RADAR" DETECTS AND MEASURES PRESENCE AND DISTANCE OF OBJECTS.

This locating system uses a unique electrostatic transducer to generate a short burst of inaudible high frequency sound. The sound travels out from the transducer in a narrow cone and reflects back to the transducer from objects in its path. The same transducer is then used to receive this reflected sound energy and convert it to an electrical signal. The VIC or 64 measures the time between the transmitted pulse and its echo and computes the distance.

SENSITIVITY: Senses objects as small as a flower stem.

RANGE: 10 inches to 35 feet.

RESOLUTION: 1/8 inch below 10 feet.

PROVEN VERSATILITY:

The combination of small size and keen precision has made the non-computer version ideal for such diverse applications as robotics, liquid level measurement, security, aids for the handicapped, electronic tape measure, vehicle back-up sensor and occupational safety. The VIC20/C64 version promises even more.

IDENTIFIES PERSONNEL BY THEIR HEIGHT.

Ceiling mounted unit recognizes family members by differences in their height.

TYPE BY POINTING AT AN "INVISIBLE KEYBOARD SUSPENDED IN AIR".

In addition to its already proven uses, the computerized version of this device might possibly be used for invisible joy-stick and game paddles, or perhaps even an invisible no-touch keyboard. A programmer could lie in bed and program his Commodore computer by simply waving his finger in the air, since this device can accurately measure the location of his finger tips to less than two tenths of an inch from 10 feet away.

Ranging module and manual. . . .$99.95
VIC-20/C64 Interface kit & tape. .$99.95
Manual and extensive documentation $19.95

Automated Training Systems
7906 34th Avenue Southwest
Seattle, WA 98126

Phone (206) 935-7032
information recording

(206) 935-2697
orders only

Circle No. 208

80-COLUMN WORD PROCESSORS

Word Manager

(Data 20; word processing and mailing list software included with purchase of 80-column board, $179.95)

The key word here is *convenience*. This package won't do many of the things that sophisticated word processing packages are expected to handle. But what it does, it makes so easy for the user that you may bless it despite the shortcomings.

Word Manager comes with a plastic strip that you place on the keyboard, just above the row of number keys. The strip tells you at a glance that you can underline by hitting f1 (the #1 function key) and 7 center by hitting f1 Shift-2, save to tape or disk with f1 Shift-1. And you set margins, not by embedded codes that you must memorize or look up each time, but simply by typing f1 and Zero. In all, 30 different operations are commanded in this engagingly simple manner. It is the height of what computer people like to call "user friendly".

A separate mailing list program, included on the same disk and required for sending customized letters to a list of addressees, was not functioning on the advance version provided to us for evaluation.

But while this package is very attractive, note the limitations: maximum of five pages per text, no headers or footers, no justification, block move limited to three lines at a time. If having these capabilities is not important to you, and your needs justify the cost, you will find Word Manager to be a program you can be comfortable using within minutes of loading. It gives the operator a freedom from function codes that makes it a pleasure.

The Word

(Pacific Coast Software: $295 including 80-column board; data base and mail merge programs planned to be included on same disk).

As powerful a word processing program as you're likely to want, with the added advantage of 80 columns. The Word is a snap for anyone familiar with WordPro, since many of the commands are the same. But a number of refinements to the control operations, and additions to the capabilities list, make this a program that will be hard to beat.

Just one example of the unexpected benefits: The Word will, on command, display on screen exactly what the printout will look like–showing not only the page breaks, but the precise page layout as well, allowing you to correct format errors in advance of printing.

What is there in life that has no drawbacks? With The Word, some operations–such as the insert and delete modes–are quite slow; and an annoying flicker (too slow a refresh rate?) occurs during some operations. There were, as well, a few other minor problems in the pre-release program we tried–corrected, we hope, by the time the package is available on store shelves. For demanding word-processing applications, The Word is a first choice. (And *my* first choice: it's the software I'm now using for my own word processing on the Commodore.)

A WORD OF WARNING: Both of the 80-column programs make use of a board that plugs into the cartridge slot in the back of the keyboard. Unfortunately, Commodore provided no way to lock the board securely into place, and it does not take much of a tap or accidental push to jar the board loose–which destroys all text in computer memory that you have not yet stored to disk, and could possibly ruin the chip in the board as well. Caveat emptor.

DATA BASE PROGRAMS

File Pac and Inquire Pac

(Pacific Coast Software: $39.95 and $69.95, respectively)

Both of these packages provide a handy filing capability for small-business or home use. They can each hold up to 200 records, with up to 15 fields of information in each record.

Fields to be sorted may contain up to 30 characters; all other fields may be as long as desired, with the only limitation that the total number of characters in all fields cannot total more than 250.

Records can be sorted on the basis of alphabetic or numeric information–arranging the files in order by customer number or zip code, for example, or by a date or a name.

The price difference between the two packages lies in the search capabilities. File Pac provides a somewhat limited ability to search for a particular record or item. With Inquire Pac, two additional types of searches are available: threshold, and conditional. The former allows searching a particular field in all records for any number between the designated values (for example, all customers who made a purchase between the first and the last of July). The latter allows you to search one or more fields for a particular series of alpha-numeric data ("People named Jones living in ZIP Code 20036.")

Only one type of file can be maintained per disk, and the new user will find some difficulty following the instructions in the User's Guides, which leave much to be desired.

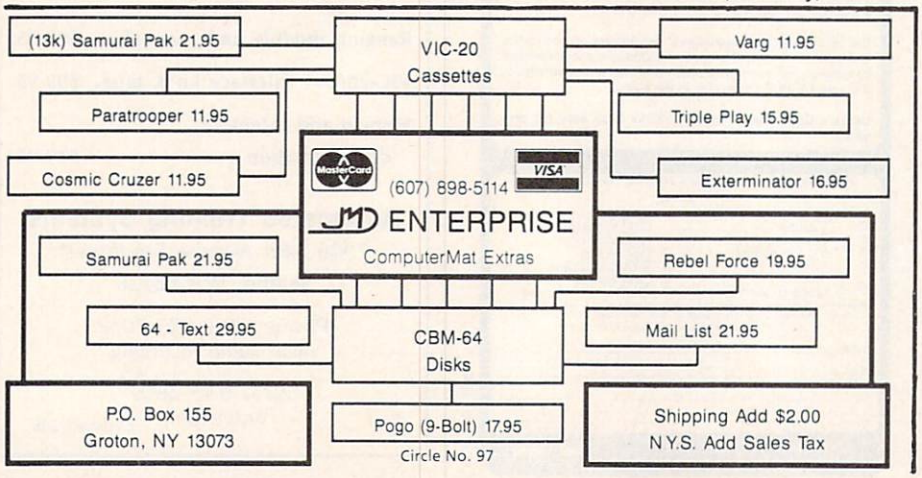
Mini–Jini

(Jini Micro-Systems: $89.95)

This is a scaled-down version of the powerful JinSam data base program used by the NASA Kennedy Space Center for a number of functions including the handling of real-time transducer data from the Space Shuttle.

Mini-Jini can handle 250 records with 10 fields in each, or as many as 500 records with a smaller number of fields. It accommodates records up to 750 characters in length. All fields can be sorted alphabetically or numerically, and the system offers the user wide flexibility in designing the format for report printouts. Mini-Jini interfaces with WordPro, so that a mailing list can be readily maintained, sorted and kept up to date on the data base program, and merged with word processing for customized billings, promotion letters or the like.

But the most noteworthy feature about Mini-Jini lies in its ability to perform calculations. You can add, subtract, multiply or divide any field with a constant, or any two fields with each other, and you can obtain the sum and average of any field. Thus you can subtract the Paid field from the Due field, then total



the results to find your gross accounts receivable.

The software conveniently comes on a chip rather than disk, and the accompanying documentation is thorough, easy to follow and well organized. Mini-Jini is a hard worker that will handle many data base/filing requirements for Commodore 64 owners and is a likely candidate for the best seller list.

Data Base Manager
(Mirage Concepts; $99.95)

A new entry (relatively speaking) which we have not yet had a chance to run, this program provides up to 200 fields per record, with as many as 250 characters per field (limited to 2,000 total characters per record). The system provides conditional sorts, multiple sorts, and powerful variety of arithmetic manipulations. If you have need for a powerful DBM, this one sounds like something worth looking into.

ACCOUNTING

ACCOUNT PAC
(Pacific Coast Software; $29.95)

Designed for home and small– (very small–) business use, Account Pac has a capacity of 99 accounts. As with most computer accounting packages, Account Pak is a "double entry" system, which means that, in accordance with standard bookkeeping procedure, each transaction must be entered in two places–for example, a deduction for your checking account and an equal amount added to the expenditures in your Postage account. This software simplifies the task by making an automatic entry in you checking account in many cases.

Printouts are limited to a bank-account listing for the current period, and balances of each account for the month and year to date, along with totals of incom items, expense items, etc.

Business Pac
General Ledger
(Pacific Coast Software; $59.95)

Any company too small to have a regular bookkeeper or accountant, but eager to computerize its financial records, will want to consider Business Pac. The software has been well designed with the user in mind, so that entries can be made with a minimum of keypressing. Yet it will provide all of the most needed reports: Trial Balance; Income Statement; and Balance Sheet.

The User's Guide is brief but quite clearly written, although sample accounts and pictures of the report format would help.

The system handles up to 99 accounts with a flexible, three-digit numbering system. A greater variety of user needs will be supported when the planned accounts receivable and accounts payable packages become available.

Info Designs
General Ledger
(Info Designs; $199)

This is the big one. General Ledger will handle 300 accounts, 1,500 transactions a month, and dollar amounts so large that you will fantasize about your company growing large enough to challenge the system (by which time you would probably be on the *Fortune* list.)

One of a series of interfaced accounting programs, General Ledger is well suited to companies that are concerned about the possibility of outgrowing a less sophisticated package. In addition to its large capacity, the system maintains account balances for present month, quarter to date, year to date, previous quarters and previous year. It will print a wide variety of routine and special reports, including all the usual ones plus a General Journal, Cash Receipts and Cash Disbursements Journals, Update reports, and several others.

The system is so sophisticated, in fact, that it may be unnecessarily complex for anyone who does not have bookkeeping or accounting experience. Also, the account numbering system–which requires entering six digits and a decimal point for the debit entry of each transaction, and an equal number for the credit entry–may seem more cumbersome than justified for a small business. CPA's and Corporate Treasurers will applaud the program. Others may get more than they were looking for.

The 77-page User's Guide gives detailed explanations, and is well illustrated with sample reports and examples. The volume suffers, however, from poor organization that does not present the information in the form or order needed by a user trying to learn the system.

Still, if you are looking for a do-everything general ledger program that your company is unlikely to outgrow, look no further.

FUTURES

Here's a short list of some programs that software houses say they expect to release soon for the 64.

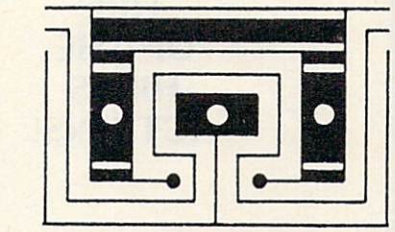
*A 40-column word processing package with the operating convenience of Word Manager (see above), enhanced with a number of features not provided on that program; from Data 20.

*A C-64 version of the best-selling Home Accountant, tailored for small business use; and C-64 version of the popular Tax Advantage personal income tax program, from Continental Software.

*A C-64 version of one of those incredible programs that asks you a series of questions in English, then writes out the complete code in Basic for the program that will do the task you have in mind; from Computer Marketing.

In an upcoming issue, we'll cover spreadsheets and more of the accounting packages now reaching the market.

WILLIAM L. SIMON is a full-time freelance writer of documentary films who holds a Ph.D. in communications but indulges his fascination with computers by writing on the subject whenever he finds a chance. He lives in Rancho Sante Fe, California.



ATTENTION OWNERS OF

commodore VIC-20 & 64 TM

WE SPECIALIZE IN SOFTWARE, ACCESSORIES & BOOKS FOR THE VIC-20™ & COMMODORE 64™ COMPUTER

Huge Selection
Fast Service—Low Prices

WRITE OR CALL FOR FREE CATALOG

THE SOFTWARE CLEARING HOUSE

Dept. C, P. O. Box 68756
Indianapolis, IN 46268
(317) 253-4855

VIC ☐
64 ☐

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
MasterCard & Visa Accepted

Write For FREE Catalog

VISA

(602) 855-3357

Call your order in and get a FREE program

NEW

Call your order in and get a FREE program

Write For FREE Catalog

MasterCard

(602) 855-3357

VIC SOFTWARE CBM 64

SAMURAI PAK

$29.95 AVAILABLE FOR VIC-20 and CBM 64 $29.95

(8K Memory Expansion Required)

SHOGUN NINJA ADVENTURE CAVES

FULL ACTION GRAPHICS.

YOU WILL NEVER TIRE OF THE HIRES ACTIONS!

SHOGUN

NEVER THE SAME GAME TWICE!

Every Game Is Different!

NINJA

HI-RES ACTION GRAPHICS

UNPREDICTABLE AND HIDDEN DANGERS

YOU WILL NEVER HAVE TO WAIT FOR ACTION!

ONE OF THE MOST EXCITING ADVENTURES YOU WILL UNDERTAKE.

TWO FREE ADVENTURES INCLUDED — *Adventure and Caves of Silver*

ComputerMat • Box 1664 Z • Lake Havasu City, AZ 86403 *Add $1.00 For Shipping*

Circle No. 185

COMMODORE 64
(more power than Apple II at half the price)

$99.50*

- 170K DISK DRIVE $159.00*
- TRACTION FRICTION PRINTER $109.00*

COMPUTER AND SOFTWARE SALE

WE HAVE THE BEST SERVICE

WE HAVE THE LOWEST PRICES

VIC-20
(a real computer at the price of a toy)

$69.50

- 40-80 COLUMN BOARD $59.00
- 32K RAM EXPANDER $95.00

*** COMMODORE 64 COMPUTER $99.50**
You pay only $199.50 when you order the powerful 84K COMMODORE 64 COMPUTER! LESS the value of the SPECIAL SOFTWARE COUPON we pack with your computer that allows you to SAVE OVER $100 off software sale prices!! With only $100 of savings applied, your net computer cost is $99.50!!

SOFTWARE BONUS PACK $29.95
When you buy the Commodore 64 Computer from Protecto Enterprizes you qualify to purchase ONE SOFTWARE BONUS PACK for a special price of $29.95!! Normal price is $49.95 (40 programs on disk or 24 programs on 5 tapes).

*** 170K DISK DRIVE $159.00**
You pay only $259.00 when you order the 170K Disk Drive! LESS the value of the SPECIAL SOFTWARE COUPON we pack with your disk drive that allows you to SAVE OVER $100 off software sale prices!! With only $100 of savings applied, your net disk drive cost is $159.00.

*** TRACTION FRICTION PRINTER $109.00**
You pay only $209.00 when you order the Comstar T/F deluxe line printer that prints 8 1/2 x 11 full size, single sheet, roll or fan fold paper, labels etc. 40, 66, 80, 132 columns. Impact dot matrix, bi-directional, 80 CPS. LESS the value of the SPECIAL SOFTWARE COUPON we pack with your printer that allows you to SAVE OVER $100 off software sale prices!! With only $100 of savings applied your net printer cost is only $109.00.

80 COLUMN BOARD $99.00
Now you program 80 COLUMNS on the screen at one time! Converts your Commodore 64 to 80 COLUMNS when you plug in the 80 COLUMN EXPANSION BOARD!! List $199 **SALE $99** PLUS—you also can get an 80 COLUMN BOARD WORD PROCESSOR with mail merge, terminal emulator, ELECTRONIC SPREAD SHEET. List $59.00 **SALE $24.95** if purchased with 80 COLUMN BOARD!! (Tape or Disk)

80 COLUMNS IN COLOR EXECUTIVE WORD PROCESSOR $69.00
This EXECUTIVE WORD PROCESSOR is the finest available for the COMMODORE 64 computer! The ULTIMATE for PROFESSIONAL Wordprocessing application! DISPLAYS 40 OR 80 COLUMNS IN COLOR or Black and White! Simple to operate, powerful text editing with a 250 WORD DICTIONARY, complete cursor and insert/delete key controls line and paragraph insertion, automatic deletion, centering, margin settings and output to all printers! Includes a powerful mail merge. List $99.00 **SALE $69.00.** 20,000 WORD DICTIONARY - List $24.95 **SALE $19.95.** EXECUTIVE DATA BASE - List $89.00 **SALE $59.00.** (Disk only).

SPECIAL SOFTWARE COUPON

We pack a SPECIAL SOFTWARE COUPON with every COMMODORE 64 COMPUTER-DISK DRIVE-PRINTER-MONITOR we sell! This coupon allows you to SAVE OVER $100 OFF SALE PRICES! $200-$300 savings are possible!! (example)

PROFESSIONAL SOFTWARE COMMODORE 64

Name	List	Sale	Coupon
Executive Word Processor	$99.00	$69.00	$59.00
Executive Data Base	$89.00	$59.00	$46.00
20,000 Word Dictionary	$24.95	$19.95	$14.95
Electronic Spreadsheet	$89.00	$59.00	$46.00
Accounting Pack	$69.00	$49.00	$32.00
Total 5.2 Word Processor			
Tape	$69.00	$56.00	$37.00
Disk	$79.95	$63.00	$42.00
Total Text 2.6 Word Processor			
Tape	$44.95	$39.00	$26.00
Disk	$49.00	$42.00	$29.00
Total Label 2.6			
Tape	$24.95	$18.00	$12.00
Disk	$29.95	$23.00	$15.00
Programmers Helper (Disk)	$59.00	$39.00	$29.95
Basic Tutor (Tape/Disk)	$29.95	$24.95	$15.00
Typing Teacher (Tape/Disk)	$29.95	$24.95	$15.00
Sprite Designer (Disk)	$16.95	$14.95	$10.00
Medicinemen (Tape)	$19.95	$17.95	$12.00
Weather War II (Tape)	$19.95	$17.95	$12.00
Professional Joy Stick	$24.95	$15.95	$11.00
Light Pen	$39.95	$19.95	$16.95
Dust Cover	$ 8.95	$ 6.95	$ 4.60

(See other items in our catalog!)

Write or call for Sample SPECIAL SOFTWARE COUPON!

EXECUTIVE QUALITY PROFESSIONAL BUSINESS SOFTWARE

The Cadillac of business programs for Commodore 64 Computers

Item	List	*SALE
Inventory Management	$99.00	$59.00
Accounts Receivable	$99.00	$59.00
Accounts Payable	$99.00	$59.00
Payroll	$99.00	$59.00
General Ledger	$99.00	$59.00

(*COUPON PRICE $49.00)

VIC-20 COMPUTER $69.50
This 25K VIC-20 computer includes a full size 66 key typewriter keyboard color and graphics keys, upper/lower case, full screen editor, 16K level II microsoft basic, sound and music, real time floating point decimal, self teaching book, connects to any T.V. or monitor!

40-80 COLUMN BOARD $59.00
Now you can get 40 OR 80 COLUMNS on your T.V. or monitor at one time! No more running out of line space for programming and making columns! Just plug in this Expansion Board and you immediately convert your VIC-20 computer to 40 OR 80 COLUMNS!! List $129. **SALE $59.00.** You can also get an 80 COLUMN BOARD WORD PROCESSOR with mail merge, terminal emulator, ELECTRONIC SPREAD SHEET!! List $59.00. **SALE $24.95** if purchased with 80 COLUMN BOARD! (Tape or Disk).

32K RAM EXPANDER $95.00
This cartridge increases programming power over **8 times!!** Expands total memory to 57K (57,000 bytes). Block switches are on outside of cover! Has expansion port!! Lists for $199 **(OUR BEST BUY!)**

60K MEMORY EXPANDER $49.00
Sixslot — Switch selectable — Reset button — Ribbon cable — CARDCO. A must to get the most out of your VIC-20 Computer!

8K RAM CARTRIDGE $39.00
Increases programming power 2 1/2 times. Expands total memory to 33K (33,000 bytes). Memory block switches are on outside of cover! Includes FREE $16.95 game.

16K RAM CARTRIDGE $55.00
Increases programming power 4 times. Expands total memory to 41K (41,000 bytes). Memory block switches are an outside cover! CARDCO Includes FREE $29.95 adventure game!!

12" GREEN SCREEN MONITOR $99.00
Excellent quality GREEN PHOSPHOROUS VIDEO MONITOR with antiglare, 1920 characters (80 characters x 24 rows). Save your TV! a must for 80 column word processors. PLUS $9.95 for VIC 20 or Commodore 64 Cable.

12" AMBER SCREEN MONITOR $119.00
Premium quality AMBER VIDEO MONITOR With antiglare, (80 characters x 24 rows), exceptionally clear screen, faster scanning. PLUS $9.95 for VIC 20 or Commodore 64 Cable.

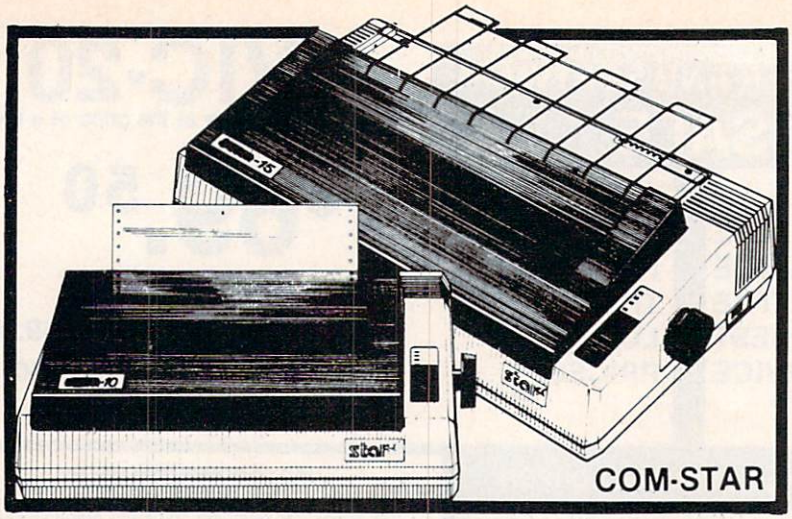
• LOWEST PRICES • 15 DAY FREE TRIAL • 90 DAY FREE REPLACEMENT WARRANTY
• BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII orders. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. VISA — MASTER CARD — C.O.D.

PROTECTO ENTERPRIZES
(WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order



FANTASTIC PRINTER SALE

as low as **$149.00**

- *15 Day Free Trial - 180 Day Immediate Replacement Warranty*

	LIST	SALE
80 COLUMN THERMAL PRINTER — 60 CPS Bi-directional, dot matrix, prints 8½" letter size paper, full 80 columns, high resolution graphics, dot bit addressable, special symbols and true decenders! (Centronics parallel interface)	$199	**$149**
80 COLUMN TRACTOR-FRICTION PRINTER — 80 CPS Bi-directional, dot matrix, impact, prints single sheets, continuous feed paper, adjustable columns, 40 to 132 characters! Roll paper adapter $32.95. (Serial or Centronics parallel interface)	$399	**$209**
PREMIUM QUALITY 10" CARRIAGE T/F PRINTER — 120 CPS Bi-directional, impact, 9 x 9 dot matrix with double strike for 18 x 18 dot matrix. High resolution bit image (120 x 144 dot matrix) underlining back spacing, left and right margin settings, true lower decenders, with super and sub scripts. Prints standard, italic, block graphics, special characters, plus 24 of user definable characters and much more!! Prints single sheets, continuous feed and roll paper! (Centronics parallel interface)	$499	**$289**
PREMIUM QUALITY 15½" CARRIAGE PRINTER — 120 CPS Has all the features of the Premium Quality 10" Carriage T/F Printer above plus a 15½" carriage and more powerful electronic components to handle large business forms! (Centronics parallel interface)	$599	**$379**
HIGH SPEED PREMIUM QUALITY T/F 10" PRINTER — 160 CPS Save printing time with these plus features: 160 CPS speed, 100% duty cycle, 8K buffer diverse character fonts special symbols and true decenders, vertical and horizontal tabs. This is Red Hot Efficiency!!! (Serial or Centronics parallel interface)	$699	**$499**
HIGH SPEED PREMIUM QUALITY T/F 15½" PRINTER — 160 CPS Has all the features of the 10" Carriage high speed printer plus a 15½" carriage and more powerful electronics to handle larger business forms! (Serial or Centronics parallel interface)	$799	**$599**

PARALLEL PRINTER INTERFACES: (IN STOCK)

- For VIC-20 and COMMODORE 64 **$49.00**
- For all APPLE COMPUTERS **$69.00**
- For ATARI 400 and 800 COMPUTERS **$79.00**

NOTE: *Other printer interfaces are available at computer stores!*

SALE SALE

WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. We accept Visa and MasterCard. We ship C.O.D.

PROTECTO ENTERPRIZES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

cardco, inc.

It's time for your computer to grow up.

VIC-20 EXPANDER SALE!

	LIST	SALE
• 8K RAM MEMORY EXPANDER (Free $16.95 Game)	$ 69.95	$39.00
• 16K RAM MEMORY EXPANDER "CARDCO" (Free $29.95 Adventure Game)	$ 99.00	$55.00
• 24K RAM MEMORY EXPANDER (Free $29.95 Adventure Game)	$159.00	$79.00
• 32K RAM MEMORY EXPANDER (Expands to total memory to 57K (57,000 bytes)	$199.00	$95.00
• 3 SLOT "CARDCO" SWITCHABLE EXPANDER BOARD	$ 39.95	$29.00
• 6 SLOT "CARDCO" SWITCHABLE "CARDCO" RIBBON CABLE EXPANDER BOARD (Lifetime warranty)	$ 99.00	$49.00
• 40-80 COLUMN BOARD	$129.00	$59.00
• PARALLEL PRINTER INTERFACE	$ 99.00	$49.00

VIC 20

40-80 COLUMN BOARD

SALE only $59.00 SALE

Now you can get 40 or 80 Columns on your T.V. or monitor at one time! No more running out of line space for programming and making columns. Just plug in this board and you immediately convert your VIC-20 computer to 40 or 80 columns! Comes in an attractive molded case with instructions!
List $129.00 **Sale $59.00**

FOR ONLY $24.95 you can get a 40-80 Column Board "WORD PROCESSOR" with mail merge and terminal emulator PLUS! AN ELECTRONIC SPREAD SHEET (like Visicalc) the word processor requires 8K—mail merge 16K! List $59.00. **Sale $39.90.** *If purchased with board only $24.95. (Tape or Disk.)

Circle No. 34

Add $3.00 for postage. Add $6.00 for CANADA, PUERTO RICO, HAWAII orders. WE DO NOT EXPORT TO OTHER COUNTRIES

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. We accept Visa and MasterCard. We ship C.O.D.

PROTECTO
ENTERPRIZES (WE LOVE OUR CUSTOMERS)
BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

SANYO MONITOR SALE!!

9" Data Monitor

- 80 Columns × 24 lines
- Green text display
- East to read - no eye strain
- Up front brightness control
- High resolution graphics
- Quick start - no preheating
- Regulated power supply
- Attractive metal cabinet
- UL and FCC approved

- *15 Day Free Trial - 90 Day Immediate Replacement Warranty*

9" Screen - Green Text Display	**$ 79.00**
12" Screen - Green Text Display (anti-reflective screen)	**$ 99.00**
12" Screen - Amber Text Display (anti-reflective screen)	**$119.00**
14" Screen - Color Monitor (national brand)	**$249.00**

Display Monitors From Sanyo

With the need for computing power growing every day, Sanyo has stepped in to meet the demand with a whole new line of low cost, high quality data monitors. Designed for commercial and personal computer use. All models come with an array of features, including up-front brightness and contrast controls. The capacity 5 × 7 dot characters as the input is 24 lines of characters with up to 80 characters per line.

Equally important, all are built with Sanyo's commitment to technological excellence. In the world of Audio/Video, Sanyo is synonymous with reliability and performance. And Sanyo quality is reflected in our reputation. Unlike some suppliers, Sanyo designs, manufactures and tests virtually all the parts that go into our products, from cameras to stereos. That's an assurance not everybody can give you!

SANYO

Official Video Products of the Los Angeles 1984 Olympics

• LOWEST PRICES • 15 DAY FREE TRIAL • 90 DAY FREE REPLACEMENT WARRANTY
• BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII orders. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. Visa - MasterCard - C.O.D.

PROTECTO
ENTERPRIZES (WE LOVE OUR CUSTOMERS)
BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

VIC 20
40-80 COLUMN BOARD

SALE

only $59.00

SALE

Now you can get 40 or 80 Columns on your T.V. or monitor at one time! No more running out of line space for programming and making columns. Just plug in this board and you immediately convert yur VIC-20 computer to 40 or 80 columns! Comes in an attractive molded case with instructions! List $129.00. **Sale $59.00.**

FOR ONLY $24.95 you can get a 40-80 Column Board "WORD PROCESSOR" with mail merge and terminal emulator PLUS! AN ELECTRONIC SPREAD SHEET (like Visicalc) the word processor requires 8K—mail merge 16K! List $59.00. **Sale $39.90.** *If purchased with board only $24.95. (Tape or Disk.)

WE LOVE OUR CUSTOMERS!

COMMODORE 64
80 COLUMN BOARD
$99.00

SALE

Now you can program 80 columns on the screen at one time! Converts your Commodore 64 to 80 coilumns when you plug in the PROTECTO 80 Expansion Board List $199. **Sale $99.00**

FOR ONLY $24.95 you can get an 80 Column Board "WORD PROCESSOR" with mail merge and terminal emulator PLUS! AN ELECTRONIC SPREAD SHEET (like Visicalc) List $59.00. **Sale $39.90.** *If purchased with board only $24.95. (Tape or Disk.)

Add $3.00 for postage. Add $6.00 for CANADA, PUERTO RICO, HAWAII orders. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. We accept Visa and MasterCard. We ship C.O.D.

PROTECTO
ENTERPRIZES (WE LOVE OUR CUSTOMERS)
BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

Circle No. 34

FLOPPY DISKS SALE *$1.19 ea.

Economy Model or Cadillac Quality

LORAN CERTIFIED PERSONAL COMPUTER DISK ***We have the lowest prices!*** LORAN CERTIFIED PERSONAL COMPUTER DISK

***ECONOMY DISKS**

Good quality 5¼" single sided single density with hub rings.

Bulk Pac	100 Qty.	$1.19 ea.	Total Price	$119.00
	10 Qty.	1.39 ea.	Total Price	13.90

CADILLAC QUALITY

• ***Each disk certified*** • ***Free replacement lifetime warranty*** • ***Automatic dust remover***

For those who want cadillac quality we have the Loran Floppy Disk. Used by professionals because they can rely on Loran Disks to store important data and programs without fear of loss! Each Loran disk is 100% certified (an exclusive process) plus each disk carries an exclusive FREE REPLACEMENT LIFETIME WARRANTY. With Loran disks you can have the peace of mind without the frustration of program loss after hours spent in program development.

100% CERTIFICATION TEST

Some floppy disk manufacturers only sample test on a batch basis the disks they sell, and then claim they are certified. Each Loran disk is individually checked so you will never experience data or program loss during your lifetime!

FREE REPLACEMENT LIFETIME WARRANTY

We are so sure of Loran Disks that we give you a free replacement warranty against failure to perform due to faulty materials or workmanship for as long as you own your Loran disk.

AUTOMATIC DUST REMOVER

Just like a record needle, disk drive heads must travel hundreds of miles over disk surfaces. Unlike other floppy disks the Loran smooth surface finish saves disk drive head wear during the life of the disk. (A rough surface will grind your disk drive head like sandpaper). The lint free automatic CLEANING LINER makes sure the disk-killers (dust & dirt) are being constantly cleaned while the disk is being operated. PLUS the Loran Disk has the highest probability rate of any other disk in the industry for storing and retaining data without loss for the life of the disk.

Loran is definitely the Cadillac disk in the world

Just to prove it even further, we are offering these super LOW INTRODUCTORY PRICES

List $4.99 ea. INTRODUCTORY SALE PRICE $2.99 ea. (Box of 10 only) Total price $29.90

$3.33 ea. (3 quantity) Total price $9.99

All disks come with hub rings and sleeves in an attractive package.

DISK DRIVE CLEANER $19.95

Everyone needs a disk drive doctor

FACTS

- 60% of all drive downtime is directly related to poorly maintained drives.
- Drives should be cleaned each week regardless of use.
- Drives are sensitive to smoke, dust and all micro particles.
- Systematic operator performed maintenance is the best way of ensuring error free use of your computer system.

The Cheetah disk drive cleaner can be used with single or double sided 5¼" disk drives. The Cheetah is an easy to use fast method of maintaining efficient floppy diskette drive operation.

The Cheetah cleaner comes with 2 disks and is packed in a protective plastic folder to prevent contamination.

List $29.95 / Sale $19.95

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII orders. WE DO NOT EXPORT TO OTHER COUNTRIES.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Canada orders must be in U.S. dollars. Visa · MasterCard · C.O.D.

PROTECTO ENTERPRIZES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010

Phone 312/382-5244 to order

Circle No. 34

GET THE MOST FROM YOUR VIC-20/C64

CASSETTE INTERFACE

- USE ANY PORTABLE CASSETTE RECORDER
- CONTROLS THE CASSETTE MOTOR
- MAKE COPIES OF ANY TAPE PROGRAM
- SATISFACTION GUARANTEED
- ONLY $34.95 PLUS $1.60 FOR SHIPPING

FULL RS232 INTERFACE

- CONNECTS TO USER PORT
- FULL RS232 CONVERSION
- CONNECTS ANY STANDARD MODEM OR SERIAL PRINTER
- COMES WITH TYPE IN BASIC TERMINAL PROGRAM
- SATISFACTION GUARANTEED
- ONLY $39.95 PLUS $1.60 FOR SHIPPING

ADD $2.50 EXTRA OUTSIDE US, CANADA OR MEXICO
SEND TODAY FOR OUR FREE CATALOG
SEE YOUR LOCAL DEALER OR CALL:
(206) 236-BYTE

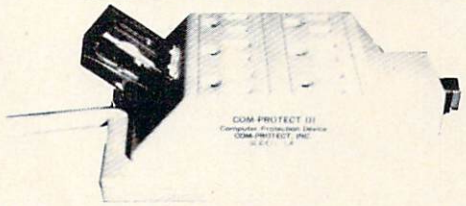
OMNITRONIX (Formerly BYTESIZE MICRO TECHNOLOGY)

PO BOX 12309 DEPT. GC2
SEATTLE, WA 98111

Circle No. 228

COM-PROTECT III®

COMPUTER PROTECTION DEVICE



SPIKE PROTECTION
SURGE PROTECTION
BROWNOUT PROTECTION
POWER DROPOUT PROTECTION
RFI FILTERING

Circle No. 16

This high performance computer protection device offers 50 nano seconds response to electrical spikes, produced by near lightning strikes, and electromotively induced spike voltages on your power line. RFI filtering, 60 DB down at 92 KHZ. Surge protection 260 volt peak (130 volts A.C.). Brownout and dropout protection shutting system down if voltage drops below 60 volts A.C. Must be manually reset, which protects disks from accidental writeover; also protects computer from surge caused by sudden power return.....$79.95

GOSUB OF SLIDELL, INC • P.O. BOX 1781
SLIDELL, LA 70459 • (504) 641-8397

Personal Check, Money Order or COD (add $2). $1.50 Postage & Handling. LA residents add 6% tax. Master Card & Visa.

The Computer Network

BUSINESS APPLICATIONS FOR THE COMMODORE 64 AND VIC 20

RELIABLE!! NEW!!

PARALLEL INTERFACE — $49.95 • New from Data 20, a Parallel interface for the unbelievable low price of $49.95!! Easy to use, simply plug it in—no software to load or switches to configure. Translates the Commodore character set to ASCII—appears to the system as a 1525 Printer. Make printing with your Commodore 64 EASY.

INVENTORY MANAGER SOFTWARE — $99.95 • Having trouble keeping track of your inventory or hobby collections? If so, our "Inventory Manager" will solve your problems. The Inventory Manager is designed to work with either the Commodore 64 or the VIC 20 with 16k & 40/80 Column expander. It gives you complete control of 2500 separate item files with 99,999 items per file. Generate reports by vendor or department, 1000 vendor possibilities, one-step posting process.

THE BEST WORD-PROCESSOR FOR COMMODORE 64 — ONLY $29.95 • The Data 20 Wordmanager has features found in word processors costing many times more. Features like on-screen editing (what you see is what you get), right justify, search & replace, block move and copy as well as many more. This package also includes integrated mailing list system—produces form letters fast. All files compatible with 80 Column version that comes free with Data 20 80-Column products. (See below)

80-COLUMN SCREEN EXPANSION FOR COMMODORE 64 OR VIC 20 • Install the Data 20 Displaymanager in your VIC 20 and you will upgrade your system to 40 or 80 Columns, plus ASCII terminal emulator, screen print feature, and Wordmanager software for 80-Column wordprocessing. 8K of expansion RAM optional.

The Video Pak 80 and the Z-80 Video Pak are designed for the Commodore 64, giving you all the above listed features, also including the FREE Wordmanager Software and integrated Mail List Program. The Z-80 Video Pak includes all the standard features, but adds a Z-80 microprocessor and a CP/M compatible operating system.

The Computer Network
P.O. Box 9840
Fountain Valley, CA 92708

Call Toll Free 800-221-9948
in California 714-855-4366

If you want your 64 to do more than play games, The Computer Network has what you want!!

Circle No. 103

Support Your Local Programmer

By Jim Grubbs

You finally entered the world of the home computer. That sale at the local flashing blue light store sure gave you a good price on your VIC. Then the rub comes. As they say, there's no such thing as a free lunch. First you've got to have some way to load and save programs. Bang-$65 for a cassette recorder that you can't even listen to! Next you find that it's very difficult to debug anything other than a simple program without a paper copy of the listing. Bang-$300 for an inexpensive printer, and that doesn't even come close to being a letter quality unit. So much for your dreams of cheap processing. As time goes on you find that the cassette recorder really is slow and wouldn't it be nice to have a disk drive. Well, the story goes on and on, but there is one common factor. Your new hobby needs some financing.

For at least some of you there is a way to get all those goodies and even deduct some of the expense from your income tax, all the while letting someone else pay for the expansion of your system. As mentioned though, there is no such thing as a free lunch. The cost to you will be a taxing of your creative ability and some of your valuable free time.

The answer is a simple one and a time honored one. Go into business for yourself. This is not a get rich quick scheme, but it could very well work out that you never have to spend another dollar of your regular income on your hobby.

The actual form of your small computer business can take several forms. We will discuss each of them, though your personal approach will most likely be a combination of several of these techniques with your own personal perspective added.

BE A CHEAPSKATE

Do not spend a fortune on your beginning system! If Aunt Mary is in the appliance business and can get you a $2000 system for $498 but you have to buy it all right now, then by all means do it. But if you are like most of us and are doing this on a budget, enter the field cautiously. Remember the idea here is to let somebody else buy the goodies for you.

You will probably find that the basic computer will keep you quite busy for several months just getting used to its personality and oddities. If you have never programmed before, or have done very little of it don't despair. The beauty of BASIC is that you start thinking in simple BASIC operations almost immediately. The next step involves realizing that you can perform the same operation using half as much memory space. As time goes on your programs become more concise and more complicated. You start to realize the potential of the machine at your fingertips. If there is a particular thing you are trying to do, look around at the software in the public domain, read COMMANDER, look at the listings of your friends' programs. Somewhere, someone has used a routine to accomplish something similar to what you have in mind. Make a note, mental or physical of how they did it. This is not to suggest you plagiarize, but rather get a feel for how something is done. Then write it your own way. It will probably be better suited to your application than if you try and force someone else's subroutine into your program anyway.

RIGHT IN YOUR OWN BACK YARD

You are now beginning to feel comfortable with your machine. Your friends are noticing the redness in your eyes from your midnight staring at the TV or monitor screen. It's time to think about your first money making project.

Do you have other hobbies? Are you particularly interested in energy conservation, fishing, sunspots, astronomy, satellites, or any other specialized area? Is there a void of program available in your subject of interest? Almost without exception the answer will be yes. Here is where we begin to make our hobby pay for itself. Choose something in your subject area that lends itself to a computer program of reasonable proportions and write one yourself. You may find that the subject you are interested in has been covered by someone else, but not for your computer. Do it! Then put it away for a while. Repeat this process until you are reasonably sure that you have the product you set out to produce or an

DEVELOP-64

LEARN

MACHINE LANGUAGE

Have Complete Control Over Your Commodore 64

- Write Fast-action Arcade-style graphics
- Fully use the Music synthesizer
- Completely understand the Computer
- Develop your skills inventory

Learn with the Tutorial that comes complete with a Full set of professional quality development tools.

Add Machine Language to your bag of tricks.

DEVELOP-64 *includes a* **Co-resident Assembler / Editor / Decoder / Debugger / Loader / Saver**
PLUS the Machine Language Programmer's Bible:

"Inside The Commodore 64"

$49.95

DEVELOP-64

Call Toll-Free 1-800-328-0145
or in Minnesota call: (612) 871-4505

French Silk

VISA MasterCard

P.O. Box 7426 Minneapolis, MN 55407

Circle No. 17

INFODISK

The truly professional

Data-base system for Commodore 64

- up to 2400 chrs/rcd
- up to 80 flds/rcd
- unlimited rcds/disk
- 19 calculation fncts
- plus much more
- ONLY $89.95

3 new aids for users of Vic 20 & C-64

- **IEEE** interface cartridge - enables you to use ANY Commodore disk drive or printer. CBM approved. $84.95
- **VICAID** 14 programmers aids, including RE-NUMBER, CHANGE, DELETE, TRACE. You need this to program..... $44.95
- **VICMON** 23 commands to help you write in machine code..... $44.95

.....Vicmon & Vicaid $84.95

MD residents add 5% tax Dealer inquires invited.

Beaver Software Systems
PO Box 88
Cabin John, MD 20818
(301) 229-4082

Circle No. 203

GENERAL SYSTEMS CONSULTING

2312 Rolling Rock Drive
Conley, Georgia 30027

CASSETTE SOFTWARE
SINCLAIR ZX81
TIMEX SINCLAIR 1000
COMMODORE VIC20
TIMEX SINCLAIR 1500
TI 99/4A
TRS80 COLOR
COMMODORE 64

DESIGNED TO HELP MONITOR YOUR FINANCES
16K MINIMUM FOR T/S 1000 & ZX81
EXTENDED OR NON-EXTENDED FOR TI & TRS80

(404) 433-7143
(404) 243-7369

* At least 3K expansion ** At least 8K expansion	ZX81 T/S 1000 T/S 1500	VIC 20	TRS 80	TI 99/4A	COMM 64	YOUR PRICE
AMORTIZATIONS (LOANS)	14.95	15.95	16.95	17.95	18.95	
BAR CHARTS	15.95	**16.95	17.95	18.95	19.95	
ANNUITY EVALUATION	14.95	15.95	16.95	17.95	18.95	
FILE MANAGER	14.95	*15.95	16.95	17.95	18.95	
BANK STATEMENT BALANCER	14.95	15.95	16.95	17.95	18.95	
CHECKBOOK SIMULATOR	14.95	NA	NA	NA	NA	
DEPRECIATION STRAIGHT LINE	14.95	15.95	16.95	17.95	18.95	
DEPRECIATION DECLINE BALANCE	15.95	16.95	17.95	18.95	19.95	
DEPRECIATION ACRS	16.95	*17.95	18.95	19.95	20.95	
DIET PLAN	12.95	NA	NA	NA	NA	
HOME BUDGET	15.95	**16.95	17.95	18.95	19.95	
HOME INVENTORY	14.95	15.95	16.95	17.95	18.95	
HOME PAYABLES	14.95	NA	NA	NA	NA	
HOME EQUITY EVALUATION	14.95	15.95	16.95	17.95	18.95	
REAL ESTATE INVESTING	15.95	**16.95	17.95	18.95	19.95	
SAVINGS INVESTMENT ANALYSIS	15.95	**16.95	17.95	18.95	19.95	
IRS 1040 LONG FORM	29.95	**32.95	34.95	37.95	39.95	
IRS 1040A SHORT FORM & 1040EZ	24.95	**27.95	29.95	32.95	34.95	
INCOME TAX PROJECTIONS	16.95	**17.95	18.95	19.95	20.95	
IRA ANALYSIS	14.95	15.95	16.95	17.95	18.95	
DISK FILE CONCEPTS	NA	**24.95	NA	NA	26.95	

TOTAL YOUR PRICE
1st CLASS POSTAGE HANDLING 3.00
GA RESIDENTS 3% SALES TAX
ADD 5.00 FOR DISK (COMMODORE ONLY)
TOTAL PRICE

NAME
ADDRESS
CITY STATE
CHARGE MY: ☐ VISA ☐ MC
CARD #
SIGNATURE
EXPIRATION DATE

Circle No. 166

even better one. I think you will find that the hard part will be keeping your hands off the program. Any program can always be made better, but there reaches a point of no return.

You can and should expect to spend many hours in this portion of the process. This is the blood and guts portion, you can't scrimp here and expect to be successful.

At this point you need to bring your documentation together. The best program in the world isn't worth much if the user can't figure out how to use it, or understand what it's supposed to do. From your documentation will come information for your instruction sheets, advertising flyers and possibly a magazine article. The best answer of course is to make your program very interactive. One learns quickly, however, that print statements use up a lot of memory. It is probably advisable to try and write your program to run on a bare, unexpanded machine. For the VIC this only gives us about 3.5K to play with. One answer to this problem is to write two versions of the same program. One can be a bare bones program, the other with all the amenities additional memory allows. You then offer the end user both programs on one tape at no additional cost. You make a lot of points here. You give them the chance to have a nice program that will run on their machine now, and gets even better when they expand their system.

MARKETING 101

Marketing your product may be one of the most frustrating parts of this project. How do you let people know what you have without spending a fortune? Nearly every hobby has a national magazine or newsletter associated with it. Most hobbies have many of these publications and usually offer space for advertisements in a classified section. The rates for these vary widely from probably 25 cents per word to several dollars per word. Place your ad or ads where they will most likely be seen by your intended audience. Keep your ad brief, but appeal to the interest of your audience. For example, say you are marketing a program to track star paths, and you are placing the ad in an amateur astronomy magazine. You might place this ad:

Star Tracking Made Easy! Computer program allows you to compute viewing times using your VIC computer, $10. SASE for further details to Jim Grubbs, PO Box 3042, Springfield, Illinois 62708.

Or this one:

VIC-20 Software makes star tracking easy, computes viewing times, $10 complete. SASE for details Jim Grubbs, PO Box 3042, Springfield, IL 62708.

The first ad is clear enough, and if you were advertising in a magazine that was aimed only at VIC users who are also astronomers it would be great. But there are probably many ads for tracking information in the ads, some of them even for computers, others for scientific calculators, some just printed charts. What makes yours unique is that it is for a VIC-20. That is who you want to attract, readers who own VIC-20s. Regardless of their interest in your program, if they don't own the needed tools to use it, it will be useless. Anyone with a VIC-20 though will continue reading, and even if they weren't looking specifically for such a program may be interested to know what is available.

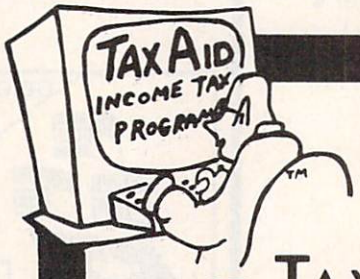
Keeping in mind that we also want to keep down the price, use abbreviations where they will be clearly understood, forget punctuation unless it's necessary, and KISS, keep it simple stupid!

Now for the bad news–you have to do all of this 45 to 120 days before you expect the ad to appear! This is part of the frustration, but due to editorial and printer's deadlines, you have to know usually two to three months before publication that you want to run the ad. There is a good news and bad in this. The good news is of course that it gives you an additional cushion to get your program ready to go out the door. You must avoid the temptation though to commit yourself to advertising a product that is not in a marketable form. Use the extra time to sweeten it up a bit, perhaps make it look a bit better, get your instructions printed, buy shipping envelopes and so on. The bad news is of course that you will drive your friends crazy waiting for the day your ad sees print.

PLEASE MR. POSTMAN

You are in print! You find this out after searching through pages of classifieds and not finding yours. You panic, they didn't publish it, or it has become so microscopically small no one can see it. Calm down and look again. It is there and ready to do its job. You wonder how you ever let me talk you into this. With resignation to gloom you wait for the mail carrier to bring at least one inquiry. The best thing to do now is to take a vacation to Kitt Peak for the next few weeks, but that is unlikely to happen. Remember, depending on where you live, you may have gotten your magazine or newsletter days or even weeks before others do. This can be particularly true of publications printed on the East Coast with readers on the West Coast.

Continued on page 115



TAX AID TAX AID

FOR COMMODORE 64™ and VIC 20™

USE TAX AID™ TO PREPARE YOUR INCOME TAX RETURN

Developed by an experienced accounting firm, TaxAid is accurate, easy to use, and comes with a detailed manual. Your tax data is permanently stored on tape or disk. The cost is tax deductible and yearly updates are available.

TAX AID I	TAX AID II	TAX AID III
For Unexpanded Vic 20	For Vic 20 with 16K	For Commodore 64
$19.95	$24.95	$24.95

Prices above are for cassette; add $5.00 for disk version.

NORTHLAND ACCOUNTING, INC.
606-D Second Ave.
Two Harbors, MN 55616
(218) 834-5012

VISA MasterCard

Circle No. 218

TAX AID TAX AID TAX AID TAX AID TAX AID TAX AID TAX AID TAX AID TAX AID TAX AID

TAXAID IS A TRADEMARK OF NORTHLAND ACCOUNTING, INC.
VIC 20 & COMMODORE 64 ARE TRADEMARKS OF COMMODORE ELECTRONICS, LTD.

DEATHSTAR

A DAZZLING 3-D GAME FOR THE 5K VIC-20
(Joystick required)

By Alan L. Keyser

Looking for hours of enjoyment? First type in this program, then immerse yourself in a world of exciting sound, flowing 3-D colors, and thrilling challenges to your space-piloting skill. Remember, the future of the universe depends on you!

HOW TO PLAY

Don't forget to plug in your joystick before turning on the computer. After you RUN the program, the screen lights up with color and motion. As you hurtle down a narrow channel in the massive surface of the Deathstar, enemy ships will appear over the horizon. You can either manuever around them with the joystick, or shoot with the fire button. You receive points for each hit, but be careful to avoid running into debris from the destroyed enemy ships. Be especially alert for the squad leader's ship, as it flies much faster than the others.

PROGRAM NOTES

Here is a general outline of the program structure:

Lines	Function
20-30	Set Up Variables
40-230	Set Up Screen
250-260	Read in M.L. Routine
300-330	Read Joystick
332-390	Move Hero
400-450	Move Missle
500-790	Alien Movement
800-860	Hero has been hit
900-985	Bonus Routine
1000-	Main Control Routine

The flowing colors are created by a machine language subroutine that rapidly alternates the red and white colors on the screen. The data for this routine, contained in lines 5000-5020, are POKEd into memory through lines 250-260. The assembly language code is listed in the accompanying box. This routine is called by SYS850 throughout the program, and barely slows down the rest of the action.

Have a thrilling flight!

```
10 PRINT"[clr]"
20 POKE36879,8:POKE36
   878,8:SCO=0
30 P%=8174:F%=0:DIMA%
   (1,2):A%(1,2)=1:A%
   (0,2)=-1:A%=8:A1%=
   A%:HERO%=4
40 PRINT"[home][down
   , 12 times][red][r
   vs-on][sp, 8 times
   ][shf-N][rvs-off][s
   sp, 4 times][rvs-o
   n][shf-M][sp, 8 ti
   mes]";
50 PRINT"[rvs-on][wh
   t][sp, 7 times][sh
   f-N][red][sp][rvs-
   off][sp, 4 times][
   rvs-on][sp][wht][s
   hf-M][sp, 7 times]
60 PRINT"[rvs-on][pu
   r][sp, 6 times][sh
   f-N][wht][sp][red]
   [sp][rvs-off][sp,
```

```
    4 times][rvs-on][s
    sp][wht][sp][pur][s
    hf-M][sp, 6 times
    ]";

70 PRINT"[rvs-on][re
   d][sp, 5 times][sh
   f-N][pur][sp][wht]
   [sp][red][shf-N][s
   sp, 4 times][shf-M
   ][wht][sp][pur][sp
   ][red][shf-M][sp,
   5 times]";
```

```
80 PRINT"[rvs-on][wh
   t][sp, 4 times][sh
   f-N][red][sp][pur]
   [sp][wht][shf-N][s
   sp, 6 times][shf-M
   ][pur][sp][red][sp
   ][wht][shf-M][sp,
   4 times]";
90 PRINT"[rvs-on][pu
   r][sp, 3 times][sh
   f-N][wht][sp][red]
   [sp][pur][shf-N][s
   sp, 8 times][shf-M
   ][red][sp][wht][sp
   ][pur][shf-M][sp,
   3 times]";
100 PRINT"[rvs-on][re
    d][sp, 2 times][sh
    f-N][pur][sp][wht]
    [sp][red][shf-N][s
    sp, 10 times][shf-
    M][wht][sp][pur][s
    p][red][shf-M][sp,
     2 times]";
```

```
110 PRINT''[rvs-on][wht][sP][shf
    -N][red][sP][Pur][sP][wht][s
    hf-N][sP, 12 times][shf-M][P
    ur][sP][red][sP][wht][shf-M]
    [sP]'';

120 PRINT''[rvs-on][Pur][shf-N][
    wht][sP][red][sP][Pur][shf-N
    ][sP, 14 times][shf-M][red][
    sP][wht][sP][Pur][shf-M]'';

130 PRINT''[rvs-on][Pur][sP][wht
    ][sP][red][shf-N][sP, 16 tim
    es][shf-M][wht][sP][Pur][sP]
    '';

140 FORI=8166TO8183:POKEI,160:PO
    KEI+30720,1:NEXTI

142 POKE8165,206:POKE8184,205:PO
    KE38885,1:POKE38904,1:POKE38
    884,4:POKE8164,160

144 POKE38905,4:POKE8185,160

150 PRINT''[home][rvs-on][wht][d
    own]SCORE:[rvs-off]''

160 PRINT''[down].[sP, 3 times].
    [sP, 2 times].[sP, 3 times].
    [sP, 4 times].[sP].[sP, 2 ti
    mes].'';

170 PRINT''[down, 2 times][sP].[
    sP, 2 times].[sP].[sP, 9 tim
    es].[sP].[sP, 2 times].'';

230 POKE8174,241:POKE8175,95:POK
    E8173,105

250 FORI=850TO897

260 READJ:POKEI,J:NEXTI

265 POKE36877,200

270 GOTO1000

300 POKE37139,0:POKE37154,127:S%
    =PEEK(37137):SN=(S%AND4)/4:S
    S=(S%AND8)/8

305 SW=(S%AND16)/16:F=(S%AND32)/
    32

310 S%=PEEK(37152):SE=(S%AND128)
    /128
320 POKE37154,255:POKE37139,128

330 IFSN<>0THEN340

332 IFP%-22<8041ORPEEK(P%-21)=20
    5ORPEEK(P%-23)=206THEN390

334 GOSUB375:P%=P%-22:GOTO380

340 IFSS<>0THEN350

342 IFP%+22>8182THEN390

344 GOSUB375:P%=P%+22:GOTO380

350 IFSW<>0THEN360

352 IFPEEK(P%-2)=206THEN390
354 GOSUB375:P%=P%-1:GOTO380

360 IFSE<>0ORP%+2>8183ORPEEK(P%+
    2)=205THEN390

362 IFPEEK(P%+2)=205THEN390

364 GOSUB375:P%=P%+1:GOTO380

375 POKEP%,160:POKEP%+1,160:POKE
    P%-1,160:RETURN
380 IFPEEK(P%)=127ORPEEK(P%+1)=1
    27ORPEEK(P%-1)=127THENGOSUB8
    00

382 IFPEEK(P%)=219ORPEEK(P%+1)=2
    19ORPEEK(P%-1)=219THENGOSUB8
    00

384 IFPEEK(P%)=218ORPEEK(P%+1)=2
    18ORPEEK(P%-1)=218THENGOSUB8
    00

386 IFPEEK(P%)=42ORPEEK(P%+1)=42
    ORPEEK(P%-1)=42THENGOSUB800

390 POKEP%,241:POKEP%-1,105:POKE
    P%+1,95

400 IFF=0ANDF%=0THEN408
401 SYS850
402 IFF<>0ANDF%=0THEN450

404 GOTO410

408 F%=P%-22:POKE36878,15:FORZ=1
    TO70:NEXT:POKE36878,8:SYS850

409 IFPEEK(F%)=127ORPEEK(F%)=219
    ORPEEK(F%)=170THEN420

410 POKEF%,160:F%=F%-22:IFF%<801
    9ORPEEK(F%)=205ORPEEK(F%)=20
    6THENF%=0:GOTO450
```

```
420 IFPEEK(F%)=127ORPEEK(F%)=219
    THENE1%=PEEK(F%):GOSUB700:GO
    SUB770:GOTO450

440 POKEF%,158

450 RETURN

500 FORI=0TO1

505 G%=A%(I,0)

510 IFA%(I,1)=0THEN650

520 IFA%(I,1)=90THEN680

530 IFA%(I,1)=127THEN695

540 X=RND(1):Y=RND(1)

545 POKEG%,160:POKEG%-22,160

550 IFY>.5THENG%=G%+22:IFG%>8182
    THENG%=0:A%(I,1)=0:GOTO610

560 IFX>.5ANDPEEK(G%+2)<>205THEN
    G%=G%+1

570 IFX<.5ANDPEEK(G%-2)<>206THEN
    G%=G%-1

580 IFPEEK(G%)=241ORPEEK(G%)=950
    RPEEK(G%)=105THENGOSUB800:GO
    TO610

590 IFPEEK(G%)=158THENGOSUB700:G
    OTO610

600 POKEG%,219:POKEG%-22,218

610 A%(I,0)=G%

615 SYS850

617 GOSUB300

620 NEXTI

630 RETURN

650 A%(I,1)=90:A%(I,0)=7998

660 POKEA%(I,0),A%(I,1)

670 GOTO620

680 POKEG%,32:G%=8043:POKEG%,219
    :POKEG%-22,218:A%(I,1)=219

690 GOTO610

695 POKEG%,160:G%=G%+A%(I,2)+22:
    IFG%>8184THENA%(I,1)=0:GOTO6
    10

696 IFPEEK(G%)=141ORPEEK(G%)=950
    RPEEK(G%)=105THENGOSUB800:GO
    TO610

697 POKEG%,127:GOTO610

699 GOTO610

700 POKE36878,15:FORZ=1TO80:NEXT
    Z

702 IFE1%=219THENSCO=SCO+50

704 IFE1%=127THENSCO=SCO+10

710 PRINT''[home][down][wht]'';T
    AB(6);SCO

730 POKE36878,8

735 A1%=A1%-1:IFA1%=0THEN900

740 IFE1%=219THENE1%=127:RETURN

750 IFE1%=127THENE1%=0:RETURN

760 RETURN

770 SYS850:FORP=0TO1:IFA%(P,0)=F
    %THENA%(P,1)=E1%

780 NEXTP:IFF%>0THENPOKEF%,160:P
    OKEF%-22,160:F%=0

790 RETURN

800 HERO%=HERO%-1:POKEP%,160:POK
    EP%-1,160:POKEP%+1,160

805 POKE36878,10

810 FORD=8TO255:POKE36879,D

830 POKE36877,260-D

840 NEXTD

850 POKE36879,8:POKE36877,200:PO
    KE36878,8:P%=8173:IFHERO%=0T
    HENPRINT''[clr]SCORE=''SC:GO
    TO2000

860 RETURN

900 PRINT''[home][down, 6 times]
    [right, 9 times][yel]BONUS:''
```

Circle No. 154

The Banner Machine™

For the **Commodore 64** (4 extra fonts available). For the **VIC-20** with 24K memory (3 extra fonts available). • Use on any Gemini or Epson MX with Graftrax or the FX and RX printers. Also Commodore 1525E and Banana with the C-64. • Menu-driven program operates like a word processor. • Makes signs up to 13" tall by any length. • Makes borders of widths up to ¾". • 8 sizes of letters from ¾" to 8" high. • Proportional spacing; Automatic centering; Right and left justifying. • $49.95 Tape or Disk (Specify computer equipment)

For the Commodore 64:

Space Raider An amazing arcade simulation. Your mission is to destroy the enemy ships. $19.95

Super Roller Challenging dice game. Sprite graphics and sound. Yahtzee-style rules of play. $14.95

Microbroker Exciting, realistic and educational stock market simulation. $34.95 Tape or Disk

Preschool Educational Programs ABC Fun; 123 Fun; and Ginger the Cat with: Addition and Subtraction, Number Hunt, and Letter Hunt. All programs have bright color, music, and action. Each $14.95

Formulator A scientific calculator for tasks which require repetitive arithmetic computations. Save formulas and numeric expressions. $39.95

Sprite Editor The easy way to create, copy, alter, and save up to 224 sprite shapes. $24.95

Cross Reference Generator for BASIC programs Locates lines with BASIC words or variable names and allows changes, and more. $19.95

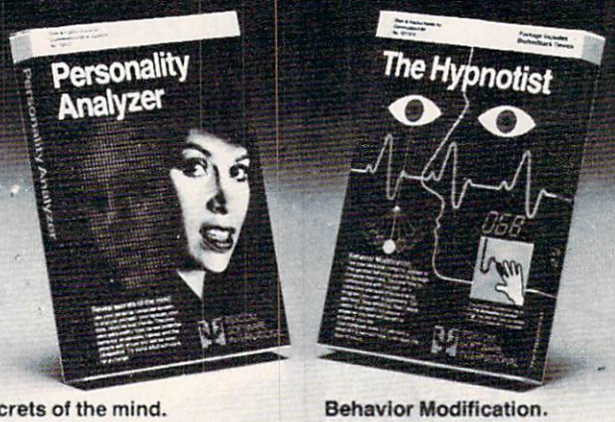
VIC-20 Programs Also Available. Ask for Catalog.

Cardinal Software™

Virginia Micro Systems
13646 Jeff Davis Highway
Woodbridge, Virginia 22191
Phone (703) 491-6502
Commodore 64 and VIC-20 are registered trademarks of Commodore Electronics Ltd.

```
910 PRINT''[home][down, 8 times]
    '';TAB(10);''[yel]1000''

920 POKE8020,42:Q=8020

930 GOSUB300

935 IFPEEK(F%+22)=42ORPEEK(F%+44
    )=42THENSCO=SCO+1000:GOSUB70
    0:GOTO975
940 IFPEEK(Q+22)=158THENSCO=SCO+
    1000:GOTO980
945 IFQ+22>8182THENPOKEQ,160:Q=0
    :GOTO980

950 IFPEEK(Q+22)=241ORPEEK(Q+22)
    =105ORPEEK(Q+22)=95THENGOSUB
    800:GOTO975
960 POKEQ+22,42:POKEQ,160:Q=Q+22

970 GOTO930
975 POKEQ,160

980 PRINT''[home][down, 6 times]
    [right, 9 times][sp, 6 time
    s]'':PRINT''[home][down, 8 t
    imes]'';TAB(10);''[sp, 4 tim
    es]''
```

Open your mind



© 1983 PATRICK J. WILLIAMS

Reveal secrets of the mind.
Use your Commodore 64 system to analyze yourself, your spouse, your date, relatives and friends. Discover your personality type, career potential, behavior tendencies, values, and the people with whom you will be most compatible. This program requires the use of a "joystick". Price $32.95 Disk ($27.95 Cassette).

Behavior Modification.
Use your Commodore 64 system to change your behavior patterns through computer hypnosis. Discover how to communicate with *yourself*, on a conscious and subconscious level. Program your own post-hypnotic suggestions. The PSI Biofeedback Device is included with this program. Price $87.95 Disk ($79.95 Cassette).

Circle No. 35

Get this software at your local dealer or order direct from:

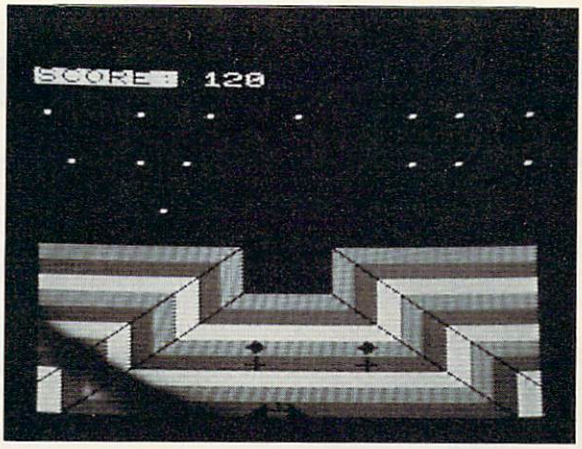
PSYCOM SOFTWARE INTERNATIONAL

2118 Forest Lake Drive
Cincinnati, Ohio 45244 USA
Telephone: 513 474-2188

TELEPHONE LINES OPEN 7 DAYS A WEEK, 24 HOURS A DAY

```
PHP             ; Store Registers
PHA
TXA
PHA
TYA
PHA
LDX #$08        ; Start Routine
LDA $97,X
AND #$0F        ; What Color is it?
CMP #$02        ; Red?
BEQ $09
CMP #$01        ; White
BEQ $0A
LDA #$01        ; Change Colors
JMP $0373
LDA #04
JMP $0373
LDA #$02
STA $97,X
INX
CPX #$FA        ; Done, No then Return
BNE $DF
PLA             ; Restore Registers
TAY
PLA
TAX
PLA
PLP
RTS
```

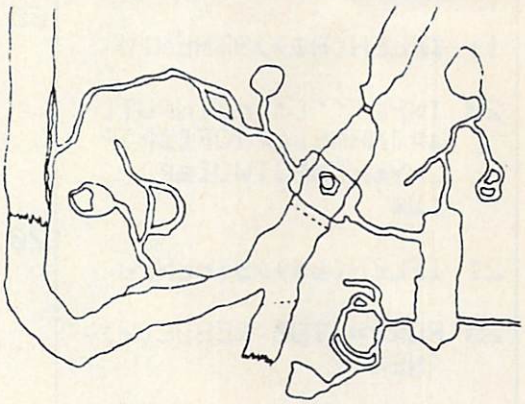
```
 985 A%=A%+1:A1%=A%:RETURN

1000 SYS850

1010 GOSUB300

1020 SYS850

1030 GOSUB500

1040 GOTO1000

2000 POKE36878,0:END

5000 DATA8,72,138,72,152,72,162,8
     ,189,0,151,41,15,201,2,240,9
     ,201,1

5010 DATA240,10,169,1,76,115,3,16
     9,4,76,115,3,169,2,157,0,151
     ,232

5020 DATA224,250,208,223,104,168,
     104,170,104,40,96
```



SUPERIOR GRAPHICS EMPORIUM

P. O. Box 99715
Tacoma, WA 98499
(206) 845-5903

DEALER INQUIRIES INVITED



"SUPER SLOT"

Vegas action in your own living room. Start with 100 coins and work your way into riches (if you can). Great color, graphics, sound and Vegas action in this - an exciting game for your "64".

$14.95 cassette; $18.95 disk

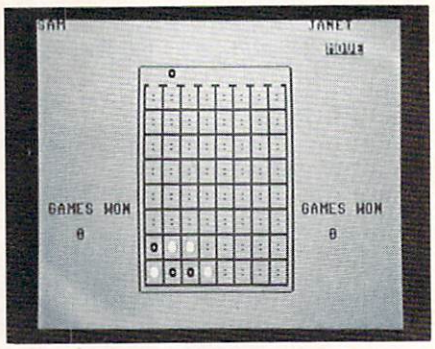
"CAVERNS OF DOOM"

Explore the vast rooms, passages and mazes in this exciting adventure game. Trying to collect all of the treasures that you can, and travel through all 183 rooms to complete your venture.

$24.95 cassette; $28.95 disk

THE BEST C/64 SOFTWARE YOUR MONEY CAN BUY!

Circle No. 160



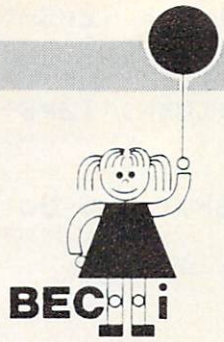
Connect-4 for C-64

By Mark Daily

In this two-player game for the C-64, your goal is to get four tokens in a row (any direction) before your opponent does. Instructions will appear on the screen. Have fun!

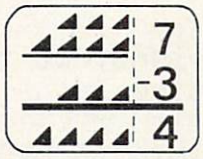
```
 1 POKE53280,0:POKE53
   281,12:PRINT''[com
   -4]''

 2 RESTORE:GOSUB850:C
   LR

 8 KV=198:VV=0

 9 CR=54272

10 INPUT''[clr]INPUT[
   sp]NAME[sp]OF[sp]P
   LAYER[sp]ONE[sp]''
   ;A$

11 IFLEN(A$)>9THEN10

20 INPUT''[clr]INPUT[
   sp]NAME[sp]OF[sp]P
   LAYER[sp]TWO[sp]''
   ;B$

21 IFLEN(B$)>9THEN20

25 FORY=1TO8:READE(Y)
   :NEXT

26 DATA2,80,78,82,-2,
   -80,-78,-82

27 W=1196:Q=1210:V=80
   :P=32:O=2:U=64

30 N$=''[down][left,
   4 times][rvs-on]MO
   VE[rvs-off]'':A=10
   :PRINT''[home][clr
   ][down, 2 times]''

51 W$=''[down, 5 time
   s][rvs-on]WINNER''
   :C1=81:C2=87:K=126

54 PRINTSPC(A)''[sp][
   com-@, 17 times][s
   p]''

55 PRINTSPC(A)''[com-
   M][sp, 17 times][c
   om-G]''

60 PRINTSPC(A)''[com-
   M] com-A][sp][com-
   R][sp][com-R][sp][
   com-R][sp][com-R][
   sp][com-R][sp][com
   -R][sp][com-R][sp]
   [com-S][com-G]''

65 PRINTSPC(A)''[com-
   M][shf--]:[shf--]:
   [shf--]:[shf--]:[s
   hf--]:[shf--]:[shf
   --]:[shf--]:[shf--
   ][com-G]''

70 PRINTSPC(A)''[com-
   M][com-Q][shf-*][s
   hf-+][shf-*][shf-+
   ][shf-*][shf-+][sh
   f-*][shf-+][shf-*]
   [shf-+][shf-*][sh
   f-+][shf-*][shf-+]
   [shf-*][com-W][co
   m-G]'':Z=Z+1:IFZ<7
   THEN65

75 PRINTSPC(A)''[com-
   M][shf--]:[shf--]:
   [shf--]:[shf--]:[s
   hf--]:[shf--]:[shf
   --]:[shf--]:[shf--
   ][com-G]''

80 PRINTSPC(A)''[com-
   M][com-Z][shf-*][c
   om-E][shf-*][com-E
   ][shf-*][com-E][sh
   f-*][com-E][shf-*]
   [com-E][shf-*][co
   m-E][shf-*][com-E]
   [shf-*][com-X][co
   m-G]''

81 PRINTSPC(A)''[sp][
   com-Y, 17 times]''
   :Z=0

85 GOSUB680:PRINT''[h
   ome]''A$:PRINT''[u
   p]''SPC(30)B$:FORA
   =1TOU

86 FORCX=W+VTOQ+VSTEP
   O:IFPEEK(CX)=C1ORP
   EEK(CX)=C2THENPOKE

87 NEXT:IFA/O=INT(A/U
   )THEN91

90 GOTO92

91 GOSUB700:D=C2:GOSU
   B810:GOTO93

92 GOSUB700:D=C1:GOSU
   B800

93 IFD=C2THEND9=0:GOT
   O95

94 D9=1

95 B1=W+54272:B=W:POK
   EB,D:POKEKV,VV:POK
   EB1,D9

96 M$='''':GETM$:IFM$
   =CHR$(13)THEN300
```

```
 97 IFM$=CHR$(52)THEN150

 98 IFM$=CHR$(54)THEN200
100 GOTO96

150 POKEB1,D9:POKEB,P:IFB-O<WTHE
    NB=Q:B1=CR+Q:GOTO160

155 B=B-O:B1=B1-O

160 POKEB1,D9:POKEB,D:IFPEEK(B+V
    /O)>PGOTO150

165 GOTO96

200 POKEB1,D9:POKEB,P:IFB+O>QTHE
    NB=W:B1=CR+W:GOTO210

205 B=B+O:B1=B1+O

210 POKEB1,D9:POKEB,D:IFPEEK(B+V
    /O)>PGOTO200

215 GOTO96

300 IFPEEK(B+V)=C1ORPEEK(B+V)=C2
    THEN96

305 POKEB,P:B=B+V:B1=B1+V:FORX=1
    TO7:IFPEEK(B+V)=C1ORPEEK(B+V
    )=C2THEN365

310 B=B+V:B1=B1+V:NEXTX

365 POKEB,D:POKEB1,D9:FORY=1TO8:
    N=E(Y):G=PEEK(B)

370 IFG=PEEK(B+N)ANDG=PEEK(B+(O*
    N))ANDG=PEEK(B-N)THEN400

371 IFG=PEEK(B-N)ANDG=PEEK(B-(O*
    N))ANDG=PEEK(B+N)THEN410

385 NEXTY:FORY=1TO8:N=E(Y):FORJ=
    1TO3:IFG=PEEK(B+(J*N))THENRG
    =1:GOTO387

386 RG=0:IFPEEK(B)<>PEEK(B-(J*N)
    )THEN395

387 NEXTJ:GOTO420

395 NEXTY,A:GOTO830

400 I=B:I1=B+N:I2=B+(O*N):I3=B-N
    :GOTO600

410 I=B:I1=B+N:I2=B-(O*N):I3=B-N
    :GOTO600
```

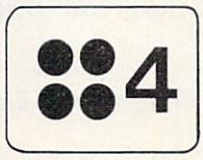



C-64 VIC 20 ATARI

CHILD DEVELOPMENT SERIES

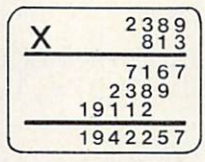


ADD/SUB — $16.95
Displays single or multiple digits with or without pictures, borrows, carries, scoring, and feedback.



NUMER-BECi — $16.95
Number recognition, object counting, object grouping, and number/size/shape discrimination.

ALPHA-BECi — $16.95
Twenty-six screens with letters/pictures/labels 'built' on the screen. (VIC-20 only)



MULT-BECi — $16.95
Multiplication program with up to four digits in multiplicand and three digits in multiplier.

All programs feature numerals and letters in extra large format on the screen and are available on cassette tapes from your dealer or directly from BECi.

Add 5% or a $2.00 minimum for postage and handling.

Write for a free brochure!

Circle No. 3

BOSTON EDUCATIONAL COMPUTING, INC.

78 Dartmouth Street
Department C
Boston, MA 02116
(617) 536-5116
Dealer Inquiries Invited

MasterCard VISA

```
420 IFRG=0THENI=B:I1=B-N:I2=B-(
    0*N):I3=B-(3*N):GOTO600

430 I=B:I1=B+N:I2=B+(0*N):I3=B+
    (3*N):GOTO600

600 IFD=C1THENPRINTSPC(3)W$:GOT
    O630

610 PRINTSPC(30)W$

630 IFD=C1THENW1=W1+1

631 IFD=C2THENW2=W2+1

632 GOSUB680

633 PRINT""[home][right, 10 tim
    es][com-@, 19 times]""

635 POKEB-V/0,U:PRINT""[home][d
    own][right, 10 times][rvs-o
    n][sp, 2 times]PLAY[sp]AGAi
    N(Y/N)"";

640 GETG$:IFG$=""""THENGOSUB650
    :GOTO640

645 IFG$=""Y""THEN27

646 PRINTCHR$(147):CLR:END

650 PRINT""[sp]?[left, 2 times]
    "";:GOSUB820:PRINT""?[sp][l
    eft, 2 times]"";:GOSUB820

655 IFA-1=UTHENRETURN

660 POKEI,D+K:POKEI1,D+K:POKEI2
    ,D+K:POKEI3,D+K:FORG7=1TO15
    0:NEXT

665 POKEI,D:POKEI1,D:POKEI2,D:P
    OKEI3,D

666 FORG7=1TO75:NEXT:RETURN

680 PRINT""[home][down, 15 time
    s][right]"";

681 PRINT""[sp, 9 times]""SPC(2
    0)""[sp, 9 times]"":PRINT""
    [sp, 2 times]"":PRINT""[up]
    ""SPC(29)""[sp, 3 times]""

683 PRINT""[home][down, 15 time
    s][right]"";

685 PRINT""GAMES[sp]WON""SPC(19
    )""GAMES[sp]WON[down]"":PRI
    NT""[sp, 3 times]""W1:PRINT
    ""[up]""SPC(31)W2:RETURN

700 PRINT""[home][down, 2 times
    ][sp, 38 times]""

750 PRINTSPC(U-1)""[sp, 7 times
    ]"":PRINT""[up]""SPC(P)""[s
    p, 4 times][up, 5 times]"":
    RETURN

800 PRINTSPC(6)N$:RETURN

810 PRINTSPC(P+4)N$:RETURN

820 FORFV=1TO175:NEXT:RETURN

830 PRINT""[home][down, 2 times
    ][right, 15 times][com-@, 9
     times]""

834 PRINT""[home][down, 3 times
    ][right, 15 times][rvs-on]I
    E[sp, 2 times]GAME[rvs-off
    ]"":GOTO633

850 PRINT""[clr][down, 13 times
    ][right, 13 times]CONNECT[s
    p]FOUR""

851 PRINT""[right, 13 times][co
    m-Y, 7 times][sp][com-Y, 4
    times]""

853 FORA=1TO1000:NEXT

859 PRINT""[clr]DO[sp]YOU[sp]NE
    ED[sp]INSTRUCTIONS[sp](Y/N)
    [sp]"";

860 GETR$:IFR$=""""THENGOSUB650
    :GOTO860

870 IFR$=""Y""THENPOKE198,0:GOT
    O900

880 POKE198,0:RETURN

900 PRINT""[clr]WELCOME[sp]TO[s
    p]CONNECT[sp, 2 times]FOUR""

910 PRINT""[down][right, 13 tim
    es][up][left, 2 times][com-
    Y, 7 times][sp, 2 times][co
    m-Y, 4 times][left, 14 time
    s][down]A[sp]TWO[sp]PLAYER[
    sp]GAME""

920 PRINT""[down, 2 times]THE[s
    p]OBJECT[sp]OF[sp]THE[sp]GA
    ME[sp]IS[sp]TO[sp]GET[sp]FO
    UR""
```

```
930 PRINT''OF[sp]YOUR[sp]PIECES
    [sp]IN[sp]A[sp]ROW,[sp]A[s
    p]THE[sp]''

940 PRINT''SAME[sp]TIME[sp]PREV
    ENTING[sp]YOUR[sp]OPPONENT[
    sp]FROM''

950 PRINT''DOING[sp]THE[sp]SAME
    .''

960 PRINT''WHEN[sp]YOU[sp, 2 ti
    mes]DROP[sp]YOUR[sp]PIECE[s
    p]IT[sp]FALLS[sp]TO[sp]''

970 PRINT''THE[sp]BOTTOM[sp]OF[
    sp]THE[sp]BOARD[sp]OR[sp]ON
    [sp]TOP[sp]OF''

980 PRINT''ANOTHER[sp]PIECE.[sp
    ]YOU[sp]CANNOT[sp]RETAKE[sp
    ]''

990 PRINT''A[sp]MOVE[sp]OR[sp]C
    HANGE[sp]PIECES.''

991 PRINT''[down, 2 times]HIT[s
    p][rvs-on]RETURN[rvs-off][s
    p]TO[sp]CONTINUE''

992 GETF$:IFF$=CHR$(13)THEN995

993 GOTO992

995 PRINT''[clr]TO[sp]MOVE[sp]Y
    OU[sp]USE[sp]THE[sp]FOLLOWI
    NG''

1000 PRINT''[down]#4[sp]KEY[sp]T
     O[sp]MOVE[sp]LEFT''

1010 PRINT''[down]#6[sp]KEY[sp]T
     O[sp]MOVE[sp]RIGHT''

1020 PRINT''[down][rvs-on]RETURN
     [rvs-off][sp]KEY[sp]TO[sp]P
     LACE[sp]YOUR[sp]PIECE''

1030 PRINT''[down, 2 times]THE[s
     p]GAME[sp]IS[sp]OVER[sp]WHE
     N[sp]ONE[sp]PERSON[sp]GETS''

1040 PRINT''FOUR[sp]IN[sp]A[sp]R
     OW[sp]EITHER[sp]UP-DOWN,''

1050 PRINT''LEFT-RIGHT,[sp]OR[sp
     ]DIAGONALLY.''

1060 PRINT''IF[sp]BOTH[sp]OF[sp]
     YOU[sp]FAIL[sp]IN[sp]DOING
     [sp]SO[sp]AND[sp]ALL''

1070 PRINT''MOVES[sp]ARE[sp]TAKE
     N[sp]THE[sp]GAME[sp]ENDS[sp
     ]IN[sp]A[sp]TIE''

1080 PRINT''[down, 2 times]HIT[s
     p][rvs-on]RETURN[rvs-off][s
     p]TO[sp]BEGIN''

1090 GETF$:IFF$=CHR$(13)THENRETU
     RN

1093 GOTO1090
```


ETT64 (c) 1983

NEW

Electronic Typing Teacher for the COMMODORE 64 Personal Computer

KEYBOARD INTRODUCTION - Meet ETT64'S Video Keyboard

1) Your Electronic Keyboard lets you practice with all keys labeled. As you watch the screen you become accustom to where each key is layed out on the Commodore 64 computer keyboard.

FINGER EXERCISES - Type Without Watching the Keys

2) ETT64'S Video Keyboard with 'VISUAL CUES' guides you while you learn to type without watching your fingers!

3) ETT64 keeps score and times you: You quickly see that you are improving with practice!

ETT64 TALK - Fun Sentences For Practice

4) Over 1000 variations — Chosen because they include every letter in the alphabet. A fresh set every time you run ETT64.

TEST YOURSELF:

CREATE YOUR OWN EXERCISES - Type Your Own Practice Sets

Then ....Test your self
5) ALSO you can save your exercises on tape / disk

RUN YOUR EXERCISES - Self-Test for Self Improvement

6) Practice your own exercises- or those provided. Options include typing each line once -- to improve accuracy, or typing each line more that once -- to improve speed.

TAPE VERSION.....$24.95 / DISK VERSION....$29.95 / Shipping $3.00
Disk version comes with 64 prewritten data files
SCHOOLS CAN SAVE upto 50% per order - Write for details
Recommended for Grades 1 thru College.

MasterCard Knight Writer Software VISA

P O BOX 598 WESTLAND MICHIGAN 48185
Phone (313) 728-0946

SEND YOUR NAME IN FOR OUR MAILING LIST AND WE WILL SEND YOU A FREE MACHINE LANGUAGE MERGE PROGRAM FOR YOUR COMMODORE 64.

THIS SPECIAL OFFER EXPIRES JAN 1984

Circle No. 169

BridgePro®

Enjoy the card game of Bridge by yourself — your computer will play the other hands.

- Easy to learn — illegal bids and plays prevented
- Cards dealt randomly — millions of different hands
- Fast machine language speed
- 2-player game options
- Complete Contract Bridge scoring
- Bidding "help" feature for beginners
- Save the score and continue later
- May repeat hands, if desired
- Option to receive the best hand
- Play "duplicate" with a friend
- Demonstration feature plays all 4 hands

Available for Commodore 64®
— Diskette $35

California residents add 6.5% tax

Computer Management Corporation
2424 Exbourne Court
Walnut Creek, CA 94596

Circle No. 217

Mystic

C-64 VIC 20*

SOFTWARE ©

Adventure Games

The Sorcerers of the Amazon:
Journey deep into the jungle to find and defeat two evil sorcerers before they take over the world.

The Catacombs of the Pharoahs:
The Pharoahs have sealed you inside a pyramid, only when you have returned their treasures will they let you out.

The Eerie Mansion:
You must explore the mansion and find all the treasures, you will have to elude monsters along the way to escape.

The Deathprobe of the Srulizons:
You must fuel and repair the probe to send it into space, freeing the earth of the threat it poses!

Crystals of Kilimanjaro:
The Evil FireDemon will succeed with his wicked scheme, unless you can venture inside Kilimanjaro and destroy his power crystals.

Other Programs

Monopoly 64: *(64 only)*
Great sounds and graphics, it also remembers your names.

Utility Plus: *(64 only)*
Adds important commands to your computer like Renumber, Auto, Unnew, ect. Also adds additional disk commands and a Machine Language Monitor.

Disk Aid Pack:
Disk of programs to help you with understanding and using your disk system. (Disk only)

Diet Comp:
Turn your computer into a diet computer, lists items.

Budget Minimizer: *(64 only)*
Very useful home and small business finance program.

All programs are $19.95 tape and $24.95 on disk.
Except Monopoly 64 is $14.95 tape and $24.95 disk.

** Vic 20 programs require 16K expansion.*

Send for FREE catalog.
Dealers inquiries are invited! Circle No. 56

Please incl. $1.50 Postage. (CA res. add 6% tax)

Mystic Software (619)443-9776
P.O. Box 536 Lakeside, CA 92040

SAIL YOUR COMMODORE INTO NEW HORIZONS

Basic Aid
- Programmers support tool
- Renumber all or part of a program
- Cross reference any BASIC program
- Produces automatic back-ups
- Renumbers all or part of a program
- Merges
- Extracts
- Finds and replaces
- One disk

low price $29.95

Koala Pad
Simply stated, the best new accessory made for the 64. It is a full graphics tablet which can be user programmed! Also opens many new applications, art and music possibilities. Includes the fantastic koala painter program on disk!
price $75.00

Allen Group Voice Box
Just plug it in: Totally programmable from BASIC or use m.l. routines from disk which are included with demo. It has so much control it sings!
price $85.00

The Smart — 64 Terminal
Exploits every feature of your C-64! Go on line to public databases or university mainframes. Has user defined keys auto answer/auto dial for 1650 modem, full file type conversions, unlimited download buffer and easy upload routines. The very best emulator!
price $39.95

Codewriter
Why write subroutines or data bases? The most fantastic item we've seen! A program that writes programs. All you do is design the screen you want by being prompted. The parameters codewriter will then write the sweetest stand along BASIC database you've ever experienced: All customized to your needs. Get this one!
price $99.95

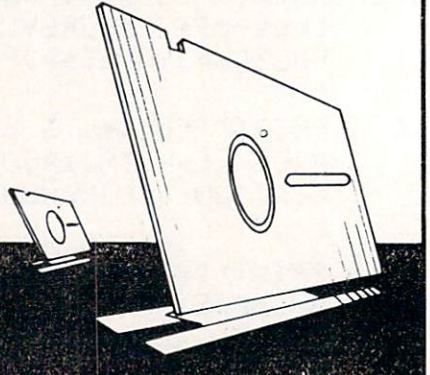
The Best Available For The

C 64

Sysres
The ultimate programming aid. Extended dos support plus extended editor which add 33 new BASIC commands. True program merge (overlay) file commands work from directory. Edit text and assembler source with out leaving BASIC! Over 700 find/change commands list any file type from BASIC. Has auto numbering. Has m.l. monitors on board, 3 trace modes: Much, much more included.
price $78.00

In addition to the most powerful collection of programmers aids and tools to be found anywhere, SAIL also carries a full line of games, books, business applications and hard to find peripherals. Call or write for our 64 catalog. SAIL gives fast service quality and support.

Shipping will be added to all orders. We accept mastercard, visa or ship c.o.d. — Call or write!



SAIL SOFTWARE®

SAIL SOFTWARE
532 Main St.
P.O. Box 2405
Branford, Ct. 06405
phone (203) 468-7414
or evenings (203) 481-7231

Circle No. 144

"Portable" Screen Control Symbols

By Noel Nyman

The Commodore special graphics commands provide an easy way to move the cursor and change screen format. However, a hard-copy listing of your program may be difficult to interpret by some one else. For example, the Commodore "clear screen" command is PRINT "[SHIFT—CLR/HOME]" which appears on the screen as a reverse heart. If you have a Commodore printer, it will print a reverse heart, although the character may be hard to read if you don't have a new ribbon. If you have another brand of printer, it probably won't print the Commodore symbol. Some intelligent interfaces will print a special code, but someone reading your listing must know what the special codes mean. My printer/interface will "lock up" and refuse to print anything when it finds a reverse heart in the program!

To make your program more readable to others, you can avoid the special graphics characters and use their CHR$ equivalents. The shifted CLR/HOME key is ASCII code 147, and the command PRINT CHR$ (147) will clear the screen. But this requires typing six more characters each time.

You can keep your typing to a minimum and still use the CHR$ codes by using the program shown in Listing 1 to start *each* program you write. Type in the program and SAVE it using the name "FORMAT." (If using a VIC-20, follow note in line 51.) Then, before you start to write a new program, LOAD FORMAT. Begin your new program with line 100. The FORMAT program assigns string names to all the special format commands and color changecodes.

The balance of the program defines a series of two character strings for cursor control and screen formatting. These string names are grouped by function in Table 1 and listed alphabetically in Table 2 to avoid duplication. The two character strings can save a lot of memory space when used for cursor control. For example, to clear the screen and move the cursor down 16 lines normally requires 21 characters. Using FORMAT, you can do it with 14.

To illustrate some of the ways you can use FORMAT, type in program Listing 2. Don't forget to load FORMAT first. Once you've experimented with FORMAT, you'll find it's an easy way to save some program writing time and make your programs more "portable" to non-Commodore printers and other program users as well.

LISTING 1

```
50 POKE53281,1:POKE532
   80,1:POKE646,0

51 REM***FOR THE VIC-
   20 THE PREVIOUS LI
   NE SHOULD READ: 50
    POKE36879,25

60 CS$=CHR$(147):CM$=
   CHR$(19):RV$=CHR$(
   18):RO$=CHR$(146):
   CT$=CHR$(20)

61 CI$=CHR$(148):CU$=
   CHR$(145):CD$=CHR$
   (17):CR$=CHR$(29):
   CL$=CHR$(157)

62 UC$=CHR$(142):LC$=
   CHR$(14):SP$=CHR$(
   32)

63 WH$=CHR$(5):RD$=CH
   R$(28):GR$=CHR$(30
   ):BL$=CHR$(31):BK$
   =CHR$(144)

64 PR$=CHR$(156):YL$=
   CHR$(158):CY$=CHR$
   (159)

65 D2$=CD$+CD$:D4$=D2
   $+D2$:D6$=D4$+D2$:
   D8$=D4$+D4$

66 U2$=CU$+CU$:U4$=U2
   $+U2$:U6$=U4$+U2$:
   U8$=U4$+U4$

67 S1$=""[sP, 10 time
   s]"":S2$=""[sP, 20
    times]"":REM 10 A
   ND 20 SPACES
```

RIDDLE OF THE MONTH

What word processing system has *all* of these features?

- Complete portability
- Built-in, after-printing correction system
- Immediate printout
- Hi-res graphic capability
- Can use nearly *any* type of paper
- Unlimited variety of printing styles
- Black-and-white or color versions available
- Self-contained power supply (no power cord or batteries ever needed)
- Extremely inexpensive

Answer: ɐ pǝnɔıl

LISTING 2

```
100 PRINT CS$;SP$;RV$;
    ''THIS[sp]IS[sp]AN
    sp]HEADER''

110 PRINT D8$;''YOU[sp
    ]CAN[sp]USE[sp]A[s
    p]2-STRING'';

120 PRINT SP$;''COMMAN
    D[sp]TO[sp]GET[sp,
     3 times]HERE''

130 PRINT D2$;SP$;SP$;
    ''YOU[sp]CAN[sp]OV
    ERWRITE[sp]A[sp]ST
    ATEMENT[sp]EASILY-
    -''

135 PRINT SP$;''FOR[sp
    ]EXAMPLE,''

140 PRINT CD$;SP$;''PR
    ESS[sp]A[sp]KEY''

150 GET A$:IF A$=''''
    GOTO 150

160 PRINT CU$;SP$;''YO
    U[sp]TYPED[sp]'';A
    $;S2$

170 PRINT D2$;RV$;''PR
    ESS[sp]ANY[sp]KEYL
    sp]TO[sp]GO[sp]ON''

180 GET A$:IF A$=''''
    GOTO 180

190 PRINT CS$;SP$;''CO
    LOR[sp]CHANGES''

200 PRINT D4$;BL$;''BL
    UE[sp]CHARACTERS''

210 PRINT CY$;''CYAN[s
    p]CHARACTERS''

220 PRINT GR$;''GREEN[
    sp]CHARACTERS''

230 PRINT PR$;''PURPLE
    [sp]CHARACTERS''

240 PRINT RD$;''RED[sp
    ]CHARACTERS''

250 PRINT YL$;''YELLOW
    [sp]CHARACTERS''

255 GOSUB 500

260 PRINT BK$;CM$;D8$;
    D4$;''YOU[sp]CAN[s
    p]USE[sp]THE''

263 PRINT '''HOME[sp]C
    URSOR'[sp]COMMAND''

270 PRINT ''TO[sp]LEAV
    E[sp]SOME[sp]TEXT[
    sp]IN''

275 PRINT ''PLACE[sp]W
    HILE[sp]CHANGING''

280 PRINT ''OTHER[sp]S
    CREEN[sp]AREAS''

285 GOSUB 500:GOSUB 50
    0

290 PRINT CM$;D8$;D8$;
    D4$;''FOR[sp]EXAMP
    LE'';GOSUB 500
```

TABLE 1

CONTROL STRING NAMES

Cursor Commands

CD$ - Cursor Down
CL$ - Cursor Left
CM$ - Cursor Home
CR$ - Cursor Right
CU$ - Cursor Up
D2$ - Two Cursor Down Commands
D4$ - Four Cursor Down Commands
D6$ - Six Cursor Down Commands
D8$ - Eight Cursor Down Commands
U2$ - Two Cursor Up Commands
U4$ - Four Cursor Up Commands
U6$ - Six Cursor Up Commands
U8$ - Eight Cursor Up Commands

Screen Commands

CS$ - Clear Screen
LC$ - Switch to Lower Case
RO$ - Reverse Off
RV$ - Reverse On
UC$ - Switch to Upper Case

Color Commands

BK$ - Black Characters
BL$ - Blue Characters
CY$ - Cyan Characters
GR$ - Green Characters
PR$ - Purple Characters
RD$ - Red Characters
WH$ - White Characters
YL$ - Yellow Characters

Line Controls

CI$ - Insert
CT$ - Delete
S1$ - Ten Blank Spaces
S2$ - Twenty Blank Spaces
SP$ - One Blank Space

TABLE 2

CONTROL STRING NAMES IN ALPHA ORDER

BK$ - Black Characters
BL$ - Blue Characters
CD$ - Cursor Down
CI$ - Insert
CL$ - Cursor Left

CM$ - Cursor Home
CR$ - Cursor Right
CS$ - Clear Screen
CT$ - Delete
CU$ - Cursor Up

CY$ - Cyan Characters
D2$ - Two Cursor Down Commands
D4$ - Four Cursor Down Commands
D6$ - Six Cursor Down Commands
D8$ - Eight Cursor Down Commands

IF - Basic Command
FN - Basic Command
GR$ - Green Characters
LC$ - Switch To Lower Case
OR - Basic Command
ON - Basic Command
PR$ - Purple Characters
RD$ - Red Characters
RD$ - Reverse Off
RV$ - Reverse On

S1$ - Ten Blank Spaces
S2$ - Twenty Blank Spaces
SP$ - One Blank Space
ST - Commodore Reserved Word
TI - Commodore Reserved Word

TI$ - Commodore Reserved Word
TO - Basic Command
U2$ - Two Cursor Up Commands
U4$ - Four Cursor Up Commands
U6$ - Six Cursor Up Commands

U8$ - Eight Cursor Up Commands
UC$ - Switch To Upper Case
WH$ - White Characters
YL$ - Yellow Characters

```
300 PRINT CM$;D8$;D8$;
    D4$;''YOU[sP]CHN[s
    P]CHANGE[sP]'';GOS
    UB 500

310 PRINT CM$;D8$;D8$;
    D4$;''A[sP]MESSAGE
    [sP]LIKE'';LEFT$(S
    2$,7):GOSUB 500

320 PRINT CM$;D8$;D8$;
    D4$;''A[sP]READER[
    sP]BOARD.'';LEFT$(
    S2$,6):GOSUB 500:G
    OSUB500

330 PRINT CM$;D8$;D8$;
    D4$;''THE[sP]LINES
    [sP]OF[sP]TEXT'';L
    EFT$(S2$,4):GOSUB
    500

340 PRINT CM$;D8$;D8$;
    D4$;''CHN[sP]VHRY[
    sP]IN[sP]LENGTH'';
    LEFT$(S2$,3):GOSUB
     500

350 PRINT CM$;D8$;D8$;
    D4$;''BECAUSE[sP]T
    HE[sP]STRINGS'';LE
    FT$(S2$,2):GOSUB 5
    00

360 PRINT CM$;D8$;D8$;
    D4$;''OF[sP]SPACES
    [sP]CAN[sP]BE'';LE
    FT$(S2$,5):GOSUB 5
    00

370 PRINT CM$;D8$;D8$;
    D4$;''ADDED[sP]TO[
    sP]BLANK[sP]OUT'';
    LEFT$(S2$,3):GOSUB
    500

380 PRINT CM$;D8$;D8$;
    D4$;''ANY[sP]PREVI
    OUS[sP]TEXT.'';LEF
    T$(S2$,3):GOSUB500

390 PRINT CM$;D2$;:END

500 FOR A=1TO1500:NEXT
    :RETURN
```

HOW TO MAKE GOOD INVESTMENTS

☆ Computer aided instruction for the Commodore 64™

Our objective is to teach you the fundamentals of stock market and real estate investment analysis.

☆ This is the first course in a series of courses on investment and financial analysis developed by experienced professionals from the top business schools.

☆ The courses are designed to cover the same material as is covered in the best business schools with some practical street techniques. The investment techniques in this initial course were selected for their ease of use and understanding. Programs and examples using those programs are provided as learning aids and for subsequent investment analysis.

☆ Course I: "HOW TO MAKE GOOD INVESTMENTS" comes complete with a 100 page text and programs on disk for $54.95.

☆ This course and additional courses may be tax deductible. (Commodore 64 is a registered trademark of Commodore Electronics Ltd.)

☆ Send $54.95 check or money order to:

The Wizards, P.O. Box 7118, The Woodlands, Texas 77387

Circle No. 155

TAX COMMAND

NOW YOUR COMMODORE OR VIC PUTS LINE-BY-LINE CONTROL OF TAX PREPARATION AT YOUR FINGER TIPS.

Calculations are automatic. All you do is enter your tax information. Tax Command does all mathematical calculations for you. **Built-in tax tables eliminate guesswork.** No more finding the right column down and right line across. Tax Command has the 1040 tax tables built right in. So it zeros in on your refund (or tax payment) amount automatically. **Tax Command is fast, easy!** Just fill in the blanks. If you make a mistake, no problem. Just go back and retype your entries. Everything is re-calculated for you. You'll find the 1040, Schedule A, Capitol Gains & Losses, Income Averaging. And more. Anyone who can read can use Tax Command. And the best feature of all ... just $24.95 plus $2.00 for shipping and handling. Wisconsin residents add 5% tax.

Practical Programs, Inc.

P.O. Box 93104-I • Milwaukee, WI 53203 • (414) 278-0829

Available at fine computer stores everywhere, or by ordering direct.

Circle No. 177

INVASION
A VIC-20 GAME

By Gene Buckle

In this section we present selected programs from our younger contributors, whose developing computer skills should encourage all aspiring programmers to keep at it.

Your task is to defend your planet from invaders in the sky. You may fire only one missile at a time, and the enemy may drop only one bomb at a time.

Press "Z" to move left, "C" to move right, and "B" to fire. You'll receive 3 base ships per game, and will score two points for each alien destroyed. May the program be with you!

```
 1 REM INVASION! BY G.
   BUCKLE

 2 POKE36879,10

 5 OF=30720

 6 VA=9*16↑3+14:VN=9*
   16↑3+13

 8 POKEVA+1,40

 9 PRINT''[clr][down,
   28 times][sp, 3 t
   imes][shf-E, 16 ti
   mes][sp, 2 times]''


13 IFPEEK(197)=35ANDB
   =0THENB=1:C=8079+A
   :L=1:P=15:POKEVN,1
   58:POKEC,160:POKEC
   +OF,4:GOTO170

20 PRINT''[home][sp,
   4 times]**[sp]INVA
   SION[sp]**''

21 PRINT''Z-LEFT,C-RI
   GHT,B-FIRE''

100 PRINT''[home][down
     18 times]''

101 FORA=38400TO38400+
    22*23  :POKEA,0:NE
    XT:A=0

105 PRINT''[9rn][sp, 3
     times][shf--]''

110 PRINT''[sp, 3 time
    s][shf-W]''

115 PRINT''[9rn][sp, 3
     times][shf-W]''

120 PRINT''[up, 3 time
    s]'';

125 IFPEEK(197)=34THEN
    GOSUB300:A=A+1:GOT
    O220

130 IFPEEK(197)=33THEN
    GOSUB300:A=A-1:GOT
    O220

135 IFPEEK(197)=35ANDB
    =0THENB=1:C=8079+A
    :L=1:P=15:POKEVN,1
    58:POKEC,160:POKEC
    +OF,4:GOTO170

136 IFL=0THEN140

137 POKEVA,P:P=P-1:IFP
    =-1THENL=0:POKEVN,
    0

140 IFB=0THEN170

141 FORH=1TO2

145 POKEC,32:C=C-22

150 IFPEEK(C)=60ORPEEK
    (C)=42ORPEEK(C)=62
      THEN600

155 IFC<7746THENB=0:GO
    TO170

160 POKEC,33

161 NEXT

170 IFD=0THEN800

172 IFD=0THEN180

174 POKEE,32:POKEE-1,3
    2:POKEE-2,32:K=K+1


176 IFE=ITHEND=0:GOTO1
    80

178 E=E+J:POKEE,62:POK
    EE-1,42:POKEE-2,60

179 IFJ=1THEN182

180 IFINT((8098-E)/22)
    =22-KAANDF=0THENF=
    1:G=E+21:M=21:GOTO
    183

181 GOTO183

182 IFINT((8098-E)/22)
    =A-KANDF=0THENF=1:
    G=E+23:M=23

183 IFF=0THEN125

184 POKEG,32:G=G+M

186 IFPEEK(G)<>32THEN7
    00
```

Continued on page 112

Battle Hymn

A C-64 MUSICAL INTERLUDE

By Harry Metz

Although the C-64's sound chip is suitable for a wide variety of video game noises, it is also capable of generating rather sophisticated music. "Real" music is much more than simply a single-note melody line. It consists of at least 3-part harmony, and a careful balance of waveform tonal colors and dynamic (loud-soft) variations.

This program presents a familiar song written with 2- and 3-note chords. Each lyric is displayed on the screen at the moment the appropriate note is sounded. The programming technique used here is known as the "time division method" because each separate 3-tone chord is played for a specific duration according to the tempo and the relative length of each note.

The structure of this program should be fairly easy to follow by anyone familiar with the basic principles of C-64 sound generation. Essentially, the computer has 3 separate "voices." At any given moment, each of the three voices can be set to produce a different musical note, or made silent. To produce a given tone on one voice, two numbers must be POKEd into memory. A table in the User's Manual lists which pairs of numbers correspond with the standard musical notes.

Each set of two DATA statements contains information about the duration, pitches, and lyric for each chord in the song. For example, line 310 is used in the following way. The first value, 20, indicates the duration of the note. (If 20 represents a quarter note, then 10 would be half as long, or an eighth note.) The next two numbers, 38 and 126, set the first voice to the highest note of the chord. The second pair, 19 and 63, set the middle note, and the last pair set the low note. The next line, 315, contains the lyric that is printed to the screen when the chord is sounded. If a pair of numbers is 0,0, as in lines 300 or 330, then the corresponding voice is silent for the duration of that note.

I hope you enjoy the results of this exercise, and feel inspired to program your own favorite tunes.

```
100 PRINT"[clr][down,
    4 times][wht]"TAB
    (7)"BATTLE[sp]HYM
    N[sp]OF[sp]THE[sp]
    REPUBLIC

105 PRINT:FOR T=1 TO 3
    000:NEXT

110 L1=54272:L2=54279:
    L3=54286

115 POKE53280,2:POKE53
    281,6

120 H1=L1+1:H2=L2+1:H3
    =L3+1

130 V1=L1+4:V2=L2+4:V3
    =L3+4

140 POKE 54296,15

150 POKE V1+1,9:POKE V
    2+2,0

160 POKE V2+1,36:POKE
    V2+2,36

170 POKE V3+1,18:POKE
    V3+2,170

180 T=TI

200 POKE V1,16:POKE V2
    ,32:POKE V3,16

210 READ S:IF S=0 GOTO
     290

220 READ X1,Y1,X2,Y2,X
    3,Y3,A$

225 PRINT"[sp]";A$;

230 IF X1 THEN POKE H1
    ,X1:POKE L1,Y1:POK
    E V1,17

240 IF X2 THEN POKE H2
    ,X2:POKE L2,Y2:POK
    E V2,33

250 IF X3 THEN POKE H3
    ,X3:POKE L3,Y3:POK
    E V3,17

260 T=T+S

270 IF T>TI GOTO 270

280 GOTO 200

290 FORJ=L1 TO 54296:P
    OKE J,0:NEXT J

300 DATA 10,38,126,0,0
    ,0,0

305 DATA MINE

310 DATA 20,38,126,19,
    63,12,216

315 DATA EYES

320 DATA 10,38,126,19,
    63,12,216

325 DATA HAVE

330 DATA 20,38,126,0,0
    ,12,32

335 DATA SEEN
```

```
340 DATA 10,34,75,0,0,12,32
345 DATA THE
350 DATA 20,32,94,19,63,10,205
355 DATA GLO-
360 DATA 10,38,126,19,63,10,205
365 DATA RY
370 DATA 20,51,97,0,0,9,159
375 DATA OF
380 DATA 10,57,172,0,0,9,159
385 DATA THE
390 DATA 20,64,188,19,63,12,216
395 DATA COM-
400 DATA 10,64,188,19,63,12,216
405 DATA ING
410 DATA 20,64,188,0,0,9,159
415 DATA OF
420 DATA 10,57,172,0,0,9,159
425 DATA THE
430 DATA 30,51,97,17,37,6,108
435 DATA LORD;
440 DATA 20,51,97,0,0,8,23
445 DATA HE
450 DATA 10,48,127,0,0,8,23
455 DATA IS
460 DATA 20,43,52,14,107,8,147
465 DATA TRAM-
470 DATA 10,43,52,14,107,8,147
475 DATA PLING
480 DATA 20,43,52,0,0,8,23
485 DATA OUT
490 DATA 10,48,127,0,0,8,23
495 DATA THE
500 DATA 20,51,97,14,107,7,53
505 DATA VIN-
510 DATA 10,48,127,14,107,7,53
515 DATA TAGE
520 DATA 20,51,97,19,63,9,159
525 DATA WHERE
530 DATA 10,43,52,19,63,9,159
535 DATA THE
540 DATA 20,38,126,25,177,12,21
    6
545 DATA GRAPES
550 DATA 10,43,52,25,177,12,216
555 DATA OF
560 DATA 20,38,126,0,0,8,23
565 DATA ''[sP, 2 times]WRATH''
570 DATA 10,32,94,0,0,8,23
575 DATA ARE
580 DATA 30,38,126,19,63,9,159
585 DATA STORED.
590 DATA 20,38,126,19,63,12,32
595 DATA HE
600 DATA 10,38,126,19,63,12,32
605 DATA HATH
610 DATA 20,38,126,19,63,12,216
615 DATA LOOSED
620 DATA 10,38,126,19,63,12,216
625 DATA THE
630 DATA 20,38,126,0,0,12,32
635 DATA ''[sP, 3 times]FATE-''
640 DATA 10,34,75,0,0,12,32
645 DATA FUL
650 DATA 20,32,94,19,63,10,205
655 DATA LIGHT-
660 DATA 10,38,126,19,63,10,205
665 DATA NING
670 DATA 20,51,97,0,0,9,159
675 DATA OF
680 DATA 10,57,172,0,0,9,159
685 DATA HIS
690 DATA 20,64,188,25,177,12,21
    6
695 DATA TER-
700 DATA 10,64,188,25,177,12,21
    6
705 DATA RI--
710 DATA 20,64,188,24,63,10,60
715 DATA ''[sP]BLE''
720 DATA 10,57,172,24,63,10,60
725 DATA SWIFT
730 DATA 30,51,97,21,154,10,205
735 DATA SWORD.
740 DATA 30,51,97,21,154,10,60
745 DATA HIS
750 DATA 30,57,172,24,63,8,147
755 DATA TRUTH
760 DATA 30,57,172,24,63,7,53
```


WE NOW CARRY THE AMAZING

prostick

ARCADE-STYLE JOYSTICK

FOR COMMODORE 64™ and VIC-20™

(Atari® Compatible)

NO. 2002

$24.95

FEATURES:

- **Switchable gateplate™ (great for maze games)**
- **Left//right firing buttons (Index finger firing reduces fatigue)**
- **5 Year limited warranty**

TO ORDER BY MAIL: Bank check, money order. Mastercard, VISA & C.O.D. orders accepted — Include Charge #, bank #, expiration date. Add $3.00 shipping & handling charges for each order (For C.O.D. add $1.60) CA res. add sales tax.

MACROTECH MARKETING

15425 Los Gatos Blvd.
Los Gatos, CA 95030
(408) 358-3430

(All products shipped with manufacturers warranty — All orders sent UPS unless otherwise specified.)

Circle No. 174

```
770 DATA 30,51,97,19,63,9,159
775 DATA MARCH-
780 DATA 30,48,127,19,63,9,159
785 DATA ING
790 DATA120,51,97,19,63,6,109
795 DATA ''ON[sp, 40 times].''
800 DATA 45,38,126,16,48,6,108
805 DATA GLO-
810 DATA 10,34,75,12,32,7,53
815 DATA RY
930 DATA 20,32,94,12,32,8,23
935 DATA GLO-
940 DATA 10,38,126,14,107,7,53
945 DATA RY
950 DATA 20,51,97,16,47,6,108
955 DATA HAL
960 DATA 10,57,172,17,37,7,53
965 DATA LE
970 DATA 60,64,189,19,63,6,108
975 DATA LU
980 DATA 60,51,97,16,47,10,205
985 DATA ''JAH![sp, 8 times].''
1000 DATA 45,43,52,17,37,7,53
1005 DATA GLO-
1010 DATA 10,48,127,16,47,10,60
1015 DATA RY
1020 DATA 20,51,97,17,37,10,205
1025 DATA GLO-
1030 DATA 10,48,127,20,100,9,159
1035 DATA RY
1040 DATA 20,51,97,21,154,8,147
1045 DATA HAL
1050 DATA 10,43,52,17,37,10,205
1055 DATA LE
1060 DATA 60,38,126,19,63,6,108
1065 DATA LU
1070 DATA 60,32,94,19,63,6,100
1075 DATA''JAH![sp, 8 times].''
1200 DATA 45,38,126,16,48,6,108
1205 DATA GLO-
1210 DATA 10,34,75,12,32,7,53
1215 DATA RY
1220 DATA 20,32,94,12,32,8,23
1225 DATA GLO-
1230 DATA 10,38,126,14,107,7,53
1235 DATA RY
1240 DATA 20,51,97,16,47,6,108
1245 DATA HAL
1250 DATA 10,57,172,17,37,7,53
1255 DATA LE
1260 DATA 60,64,189,19,63,6,108
1265 DATA LU
1270 DATA 30,51,97,16,47,10,205
1275 DATA''JAH![sp, 8 times].''
1300 DATA 30,51,97,16,47,7,53
1305 DATA HIS
1310 DATA 30,57,172,10,205,8,147
1315 DATA TRUTH
1320 DATA 30,57,172,10,205,8,147
1325 DATA IS
1330 DATA 30,51,97,19,63,9,159
1335 DATA MARCH-
1340 DATA 30,48,127,17,37,9,159
1345 DATA ING
1350 DATA 100,51,97,16,47,6,108
1355 DATA ON.
1360 DATA 0
1370 PRINT:PRINT:PRINT
```

Jeff and Marilyn Mitchell "designed" their new program themselves. CodeWriter wrote all the computer code. The Mitchells' dream is thriving on fulfilling other people's wishes. Their new home business needs very special information fast: Which fantasies are still open? What's our next completion date? Can we get a list of all fantasies needing out of state travel?

They got it all—with no computer hassle.

And you can too, with CodeWriter. No programming. No. 'computerese'. At home or at the office, you create your own programs to handle any information you want—at your fingertips; Payables, receivables, inventory, credit cards, tax details, club or church records—always organized your way.

You work with CodeWriter in plain English. Simply 'draw' any screen layout, add any calculations you'd like done—or help messages you need—and you're done. CodeWriter writes all the BASIC code.

In minutes you've got YOUR OWN PROGRAM on YOUR OWN DISK. You don't need CodeWriter again until you want a new program.

You can begin with **Home FileWriter™** and expand to more complete business systems with full report and menu design features.

You can get CodeWriter for the Commodore 64®, Atari®, Apple®, IBM PC®, Commodore Business Machine®, Victor 9000®, and Kay Pro II®, computers. Prices range from $69 to $249.

You think this much power can't come this easy? There are thousands of CodeWriter systems in use all over the world—80% are first time computer owners. CodeWriter writes solutions the first time you try!

"This is our first business, our first computer, and our first program—and we really did it ourselves!"

CodeWriter™ A Dynatech Company
Dynatech Microsoftware Inc.

7847 N. Caldwell Ave. Niles, Ill. 60648
Toll-Free 1-800-621-4109 (in Ill. 312-470-0700)

AVAILABLE AT **VideoConcepts®**
Your Home Entertainment Store
180 STORES NATIONWIDE

Circle No. 159

HIGH RESOLUTION SCREEN DUMP FOR C-64

By Robert Parr

What is a screen dump? A screen dump is a program that allows you to draw a graphic picture on your computer's screen, and then have the printer make an exact duplicate of the picture.

For a screen dump program to work, you must have a dot matrix printer with dot-addressable graphics. Although a hi-res screen dump is fairly easy through a Commodore printer, accomplishing it with other common dot-matrix printers is more difficult. I have included listings for both Epson and Prowriter printers, because most brands of dot-matrix printers are compatible with one or the other.

PROGRAM DESIGN

Because I was interested in creating a program that would be organized in a simple manner and could easily be altered, I spent a little time trying to design a detailed input routine. The one I included (contained in lines 10-40) lets you enter your design from the keyboard, and then tell the computer that you are finished by pressing the <f1> key. It is cumbersome, but does get the job done.

Before I can explain how the rest of the program works, you need to know how a matrix printer works. Instead of printing an entire character at once as a typewriter does, it forms letters from individual dots, similar to newsprint. The print head that slides from side to side in your printer creates the dots by striking the printer ribbon with various combinations of eight "pins". These "pins" are arranged vertically within the print head.

During normal operation, the dot patterns for the ASCII character set are already stored in the printer's memory. Whenever the printer receives an ASCII code for a particular character, it instructs the "pins" to fire in the appropriate pattern, which in turn forms the character. However, it is possible for control of the print head to be transferred directly to the computer. By doing so, high-resolution graphics from the printer may be obtained.

A computer monitor is operated in much the same manner. The letters or graphic characters you see on the screen are created by numbers that correspond to horizontal rows of dots. These numbers are in binary notation, and are stored in the computer ROMs.

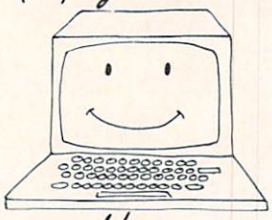
The principle behind this particular screen dump program is this–if you can take the numbers that are used by the screen to form character images, and convert them to numbers that can be utilized by the printer to make the same character, you can print any character available from the Commodore character set.

Here is how the dump routine works. Lines 100–130 copy the character ROM into RAM. This allows the program to read the eight numbers that the computer uses to create its characters on the screen. Lines 140–160 dimension the variables that will be used in the conversion, and set up the printer for regular-density dot-addressable graphics. Lines 170–190 determine what character is to be compiled next, and store the values from the copied character ROM for that letter in variables H(0)–H(7). Lines 200–260 take care of the actual conversion, and lines 260–320 instruct the printer to print the characters one row at a time.

One more note about program operation. Because it is written in BASIC, the program is very slow. It will take about one and one-half minutes after you press the <f1> key before the first line is printed, and approximately 30 minutes to copy the entire screen. Therefore, try to keep smaller pictures centered in the top portion of the screen, and then press the <run/stop> key once your picture is printed. This will cut down considerably on wasted run time.

```
10 PRINT ''[clr]'';

20 GET A$:PRINT ''[rvs-on][sp][
   left][rvs-off]'';:IF A$=''''
    THEN 20

30 IF A$=CHR$(133) THEN PRINT
   ''[sp]'';:GOTO 100

40 PRINT A$;:GOTO 20

100 POKE 56334,PEEK(56334) AND 2
    54:POKE 1,PEEK(1) AND 251
```

(M)agreeable™



software

TAX HELPER™

Commodore 64™

Tax HELPER 1.83 performs all arithmetic for Form 1040 and Schedules A, B, and G. Does not calculate tax. Saves results to diskette.

Diskette: $17.00 plus $1.25 shipping.

Tax HELPER 2.83 also does Schedules C, D, E, F, G, SE, and W and Form 4562. Calculates tax, prints reports, and more.

Diskette: $30.00 plus $1.25 shipping.

VISA/MasterCard accepted

Circle No. 99

(M)agreeable software, inc.

5925 Magnolia Lane • Plymouth, MN 55442
(612) 559-1108

HELPER is a trademark of (M)agreeable Software, Inc.
Commodore 64 is a trademark of Commodore Electronics Ltd.

BASIC BYTE JUST MADE MANAGING YOUR STOCK PORTFOLIO EASIER

Introducing PORTFOLIO MANAGER by Basic Byte, a high-quality, easy-to-use software program for use on your Commodore 64 or VIC 20 (16K RAM) personal computer.

It's designed to eliminate hours of time consuming paperwork. And make it easy for you to handle your investments.

PORTFOLIO MANAGER lets you instantly update your stock's current value. Calculate gains and losses. Record dividends. Print reports. Even determine the price per share after your broker's commission. All you have to do is follow the easy, step-by-step instructions.

The price? Only $29.95. And that makes PORTFOLIO MANAGER a great investment by itself.

You'll find PORTFOLIO MANAGER on tape or disk drive at your local dealer. Or call direct (313) 540-0655 or write P.O. Box 924, Southfield, MI 48037 and order yours today.

BASIC BYTE, INC.

Circle No. 162

```
110 FOR I=0 TO 127:FOR J=0 TO 7:
    POKE 32768+I*8+J,PEEK(53248+
    I*8+J):NEXT J:NEXT I

120 POKE 1,PEEK(1) OR 4:POKE 563
    34,PEEK(56334) OR 1

130 POKE 55,255:POKE 56,127

140 DIM B(63):DIM V(39,7):S=0:OP
    EN 4,4,4

150 PRINT#4,CHR$(27)"H"CHR$(8)

160 PRINT#4,CHR$(27)CHR$(75)CHR$
    (64)CHR$(1);

170 FOR CL=1024 TO 2023:C=PEEK(C
    L)

180 L=(C*8)+32768

190 FOR X=0 TO 7:H(X)=PEEK(L+X):
    NEXT X

200 FOR Z=0 TO 63:B(Z)=0:NEXT

210 N=128:Q=0:FOR X=0 TO 7:M=128
    :FOR Y=0 TO 7

220 IF H(X)=>M THEN B(Y+Q)=N:H(X
    )=H(X)-M

230 M=M/2:NEXT Y:Q=Q+8:N=N/2:NEX
    T X

240 FOR Y=0 TO 7

250 V(S,Y)=B(0+Y)+B(8+Y)+B(16+Y)
    +B(24+Y)+B(32+Y)+B(40+Y)+B(4
    8+Y)+B(56+Y)

260 NEXT Y:S=S+1

270 IF S<40 THEN 320

280 FOR S=0 TO 39:FOR Y=0 TO 7:P
    RINT#4,CHR$(V(S,Y));:NEXT Y:
    NEXT S

290 S=0

300 CLOSE 4,4,4:OPEN 4,4:PRINT#4
    ,CHR$(13);:CLOSE 4,4:OPEN 4,
    4,4
310 PRINT#4,CHR$(27)CHR$(75)CHR$
    (64)CHR$(1);

320 NEXT CL:CLOSE 4,4
```

BLIVET SOFTWARE

Ludwig's Castle 8K Adventure	VIC/64	9.95
Weapon of Choice 16K Adventure	VIC/64	14.95
Dungeon Runner 24K Adventure	VIC/64	19.95

CENTURY MICRO

8K RAM EXPANSION		29.95
16K RAM EXPANSION		44.95
64K RAM DISK (VIC)		99.95
MOSES ASSEMBLER VIC,CT		49.95
MOSES ASSEMBLER 64,DC		29.95
DELUXMON VIC/64,CT		19.95

GALACTIC SOFTWARE

20 MAIL LIST D,C		21.95
64 MAIL LIST D,C		23.95
FINANCIAL ASSISTANT 64D		39.95

PROGRESSIVE PERIPHERALS

Gothmogs Lair 64 D		29.95
Cyber World 64 2 Disks		39.95
Smart Slot 64 4 slot Intelligent Exp		79.95
Auto Clock VIC/64		99.95

CUSTOM CARTRIDGES

We offer the following products and services:

Blank Cartridge (W/Case) VIC/64	10.95

The following EPROMS are available for our cartridge:

2732	5.95
2764	7.95
27128	WRITE

Custom Programming:

2732's 1 ea	2.00
2764's 1 ea	2.50
27128's 1 ea	3.00*

*You supply the 128

Please include all of the information needed to properly program and set up your cartridge.VIC cartridges need to know which block (1,2,3 or 5) and the 64 crt's need to know LO Rom or HI Rom.

HOW TO ORDER

Send check or money order to SOFT SACWARE. All orders shipped within 48hrs and if items are not in stock we will return your payment if you specify.

Add 3% ($3.00) MIN For Shiping and handling.

CA Residents add 6% Tax

SOFT SACWARE
4607 STAGGS WAY
SACRAMENTO, CA 95822

Circle No. 145

Commodore 64 – Vic 20

EDUCATIONAL SOFTWARE

TEACHER DEVELOPED – CLASSROOM TESTED

FOR QUICK MASTERY OF BASIC CONCEPTS.

COMPETITIVE GAMES DESIGNED TO IMPROVE THINKING SKILLS.

All programs self-explanatory. Easy to use. Learn at your own pace at home or at school.

GRAMMAR: 3 or 4 complete programs
MATH: 4 or 5 programs
PHONICS: 3 or 12 programs
FUN PACKS: 3 or 4 programs

REES SOFTWARE LABORATORIES

GRAMMAR PROGRAMS

G1 Parts of Speech I $19.95
Nouns
Adjectives
Personal Pronouns
Indefinite Pronouns

G2 Parts of Speech II.....$19.95
Verbs
Helping Verbs
Adverbs

G3 Parts of Speech III.....$19.95
Prepositions
Conjunctions
Interjections

G4 Sentence Structure....$19.95
Subjects
Predicates
Objects

G5 Capitalization and Punctuation $19.95
Capitalization
Punctuation. Apostrophes and Quotation Marks
Punctuation II. End Marks

G6 Homonyms, Antonyms, and Synonyms.....$19.95
Homonyms
Antonyms
Synonyms

G7 Phrases, Prefixes, and Suffixes.....$19.95
Phrases
Prefixes
Suffixes

PHONICS PROGRAMS

P1 Phonic Blends.....$39.95
3 Programs
3 Voice Tapes

P2 Word Blends.....$49.95
3 Programs
4 Voice Tapes

P3 Computer Phonics $49.95
Pre-Test
Long and short vowels (10 programs)
Post-Test

MATH PROGRAMS

M1 Number Theory.....$19.95
Place Value
Reading Large Numbers
Rounding Off
Math Drills
Addition
Subtraction
Multiplication
Division

M2 Conversions $19.95
Inches to Feet to Yards
Pints to Quarts to Gallons
Roman to Arabic Numerals
Metrics 1.2

M3 Fractions I $19.95
Fractions to Percent Conversion
Adding Fractions (with carrying)
Subtracting Fractions (with borrowing)
Sequence Patterns

M4 Fractions II/Decimals....$19.95
Multiplying Fractions
Reducing Fractions
Adding and Subtracting Decimals
Multiplying Decimals

FUN PACKS

F1 Fun Pack I.....$19.95
Quarter Back Challenge
Magic Cards
Latin Magic
Haunted Mansion

F2 Fun Pack II $19.95
Amazing Craze
Missile Attack
Roaring Cycle

F3 Fun Pack III $19.95
Magic Spell
States and Capitals
Choice Hangman

ALL PROGRAMS AVAILABLE ON DISKETTE OR CASSETTE

Phone Orders: REES SOFTWARE LABORATORIES (714) 980-9562

QTY.	SERIES NO. & NAME	DISK.	CASS.	PRICE EA.	TOTAL

SUBTOTAL	
Postage & handling	$1.50
3% (VISA/MC)	
CA residents 6% tax	
TOTAL	

REES SOFTWARE LABORATORIES, INC.
Post Office Box 763
Cucamonga, CA 91730

Circle No. 77

VISA/MC (Include charge card no. & expiration date)

GOSUB OF SLIDELL, INC.

COMMODORE 64 SOFTWARE

GOSUB of Slidell:

64-MATH FLASH.....(T 9.95/D 11.95)
Math drill for all ages. Numbers on screen are six times their normal size. Addition, Subtraction, Multiplication, and Division. Operations may be mixed. 13 levels of difficulty.
FOLLOW ME.....(T/D 15.95)
Simon style game for the Commodore 64. Game is played by repeating sequences of lights and tones that the computer or another player generates.
TEMPERATURE.....(T 9.95/D 11.95)
Part one explains temperature, the scale used to measure temperature and the relationships between them. Part two is a temperature conversion program allowing conversion between Fahrenheit, Celsius, Kelvin, and Rankin scales. Excellant Graphics for the Commodore 64.
FIN. RATIO.....(T/D 49.95)
This is a program for the Commodore 64 that computes the ratios involved in Manufacturing Industries. The following ratios are computed: Liquidity Ratios, Leverage Ratios, Activity Ratios, Profitability Ratios, Coverage Ratios and Stock Ratios.
COPY UTILITY.....15.95
Two utility programs, one for a single 1541 system the other for a two 1541 system. This routine will copy each Track and Sector starting with Track 1 Sector 0 and will continue through Track 35 Sector 16. For the Commodore 64.

SOUTHERN SOFTWARE:

COMPUTER CHECKBOOK.....(D 15.95)
Keeps a running tabulation of deposits, checks, and service charges.
MUSIC MAKER.....(D 15.98)
14 different instruments can be played using the Commodore 64 keyboard.
GRADE BOOK -64.....49.95
Enter and save all grades for up to nine classes. Each class may contain up to 50 students and up to nine report periods per student. Constantly updated grade average, by week and by subject. All output may be to screen or printer.

COMMODORE SOFTWARE

C-64 Cartridge
Avenger.....11.50
Kickman.....13.50
Speed/Bingo Math.....13.50
Jupiter Lander.....11.50
Visible Solar System.....16.50
Lemans.....11.50
Radar Rat Race.....11.50
Pinball Spectacular.....11.50
Super Smash.....11.50
Blue Print.....13.50
Gorf.....13.50
Omega Race.....13.50
Lazarian.....16.50
Clowns.....13.50
Sea Wolf.....15.50
Tooth Invaders.....11.50
Star Post.....13.50
Wizard of Wor.....13.50
Frogmaster.....13.50
Star Ranger.....13.50
CP/M 2.2.....55.95
SIMONS' BASIC.....16.95

C-64 DISK
EASY SCRIPT.....40.00
EASY MAIL.....19.95
EASY SPELL.....17.95
GENERAL LEDGER.....37.95
LOGO.....40.00
ZORK I.....24.95
ZORK II.....24.95
ZORK III.....24.95
SUSPENDED.....24.95
STARCROSS.....24.95
DEADLINE.....24.95

BRODERBUND SOFTWARE

David's Midnight Magic (D).....25.00
Choplifter (cart).....33.00
Seafox (cart).....33.00
Lode Runner (cart).....30.00
Lode Runner (D).....25.00

SIERRA ON-LINE

Frogger (D).....25.95

EPYX

Temple of Apshai (D).....29.95
Upper Reaches of Apshai (D).....14.95
Curse of Ra (D).....14.95
Sword of Fargoal (D).....22.95
Crush, Crumble & Chomp (D).....29.95
Jumpman (D).....29.95
Pitstop (D).....29.95
Lunar Outpost (D).....29.95
Swat Rescue (D).....29.95
Dragonriders (D).....29.95
Silicon Warrior (d).....29.95

CARDCO PRODUCTS

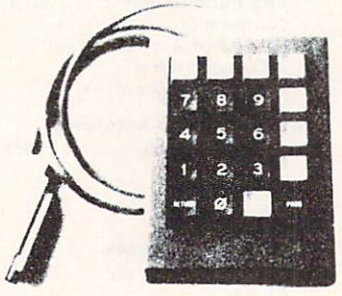
CARDPRINT.....69.00
VIC-20 & C 64 Parallel input printer interface.
CARDBOARD/S.....59.95
Five slot expansion interface for the C 64.
WRITE NOW.....49.95
Word processor on cartridge for the C 64.
MAIL NOW.....34.95
Mailing list program on Disk for the C 64.
CARDKEY/1.....39.95
Sixteen numerical key pad with software for the VIC-20 & C 64.
CARDETTE/1.....30.95
VIC-20 & C 64 universal cassette interface.
CARDRITER/1.....23.95
VIC-20 & C 64 Light pen with switch & programs.
PRINTER UTILITY PROGRAMS.....15.95
Tape software & screen dump for the VIC-20 & C 64.

ACCESS SOFTWARE

Neutral Zone (D/T).....27.95
Beach Head (D/T).....27.95
SPRITEMASTER (D/T).....29.95

COVERS

Datasette-old style.....5.00
Datasette-new style.....5.00
1541 Disk Drive.....10.00
VIC-20/C 64 Keyboard.....9.00



THE FLEXIKEY SYSTEM

$69.95

19 keys, each of which may have 3 seperate definitions!
Complete documentation including program listings!
Works on the VIC-20 (Expanded) and C-64 computers!
Compatible with most existing software!
Great for use with business programs and electronic spread sheets!
Ideal for machine language programmers!

WRITE FOR FREE CATALOG

TO ORDER:
GOSUB of Slidell, Inc.
P.O. Box 1781
Slidell, La 70459
(504)641-8307

Handling charges $2.00
C.O.D. add $2.00
Master Card & VISA (add 3%)
Prices subject to change

Dealer Inquiries on Gosub, Willson Data Products and Southern Software welcome.

MasterCard VISA

C-64 and VIC-20 are registered trademarks of Commodore International.

WILLSON DATA PRODUCTS

MONEY MANAGEMENT SYSTEM 4.0 (D/T).....29.95
The easy profressional way to manage all your bank accounts. Tracks all outstanding checks and deposits until paid, prints statements, balances accounts, and allows searching of files by any parameters you chose. The most versatile checkbook program we have ever seen.
PERSONAL DATA BASE 2.2 (D).....29.95
Uses relative files to allow maximum number of records possible on the 1541 disk drive. User formated screens and reports.
MAILING LIST (D).....29.95
Uses relative files to allow over one thousand names on a single mailing list. Prints mailing labels and lets you sort by any field.
INVENTORY CONTROL SYSTEM 2.6 (D).....49.95
Complete inventory control system for small businesses.
STARGUARD (D/T).....24.95
Fast action two player arcade game.
STAR TREK (D/T).....24.95
Souped up version of the old favorite with lots of color, sound and super excitement.
THE LIGHT PEN.....24.95
Low cost, high sensitivity model with barrel mounted switch and five foot cord. Comes with instruction manual and software.
THE PORTA START.....14.95
A reset module that plugs into the user port of either the VIC-20 or the C-64 and comes with a program on tape which allows you to recover a program after lock-up, reset, or accidental new.

Home Budget (T).....14.95
Home Budget (D).....16.95
Master Mind (T).....14.95
Master Mind (D).....16.95
Personal Ledger (T).....14.95
Personal Ledger (D).....16.95
Home Inventory (T).....14.95
Home Inventory (D).....16.95

SYNAPSE

Fort Apocalypse (D).....26.95
Pharaoh's Curse (D).....26.95
Survivor (D).....26.95
Survivor (D).....26.95
Protector II (D).....26.95
Shamus (D).....26.95
Drebs (D).....26.95
Morgal (D).....26.95
Sentinal (D).....26.95

VIC-20 SOFTWARE

GOSUB OF SLIDELL

GOLD MINER.....(T 15.95)
Guide your Gold Miner through the mine shafts, opening new shafts with your explosive charges and picking up gold as you go. But be careful, the walls may cave in on you. Take your gold to the assayers office and exchange it for cash and then return to the mine for more. Four levels of difficulty. Excellent Graphics (Unexpanded VIC).

SOUTHERN SOFTWARE (TAPE)

COMPUTER CHECKBOOK.....9.95
SPELLING FLASH.....9.95
COMPUTER HANGMAN.....9.95
A BOMB SQUAD.....9.95
MEMORY CHALLENGE.....9.95
YOT-ZEE.....9.95
MONTHLY BUDGET.....9.95
E.T.MATH.....9.95
SEA WAR.....9.95
TOT TUTOR.....9.95
TEACHER'S PET.....9.95
BATTLE FLEET.....9.95

COMMODORE SOFTWARE

VIC-20 Cartridge
VIC Avenger.....11.50
Superslot.....11.50
Super Alien.....11.50
Jupiter Lander.....11.50
Draw Poker.....11.50
Midnight Drive.....11.50
Radar Rat Race.....11.50
Sargon Chess II.....16.50
Pinball Spectacular.....16.50
Super Smash.....11.50
Cosmic Cruncher.....11.50
Gorf.....13.50
Omega Race.....13.50
Money Wars.....11.50
Clowns.....13.50

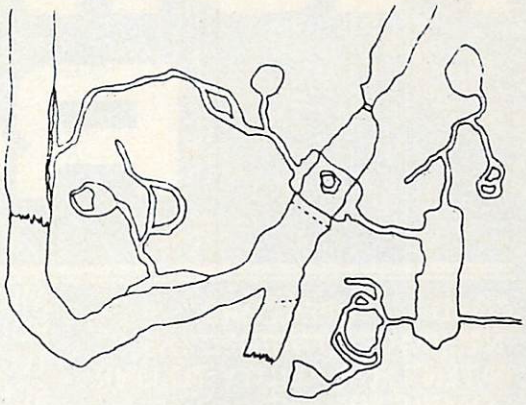
WILLSON DATA PRODUCTS

Master Mind (BK-T).....14.95
Master Mind (BK-D).....16.95
Star Trek (BK-T).....14.95
Star Trek (BK-D).....16.95
Personal Ledger (16K-T).....14.95
Personal Ledger (16K-D).....16.95
Home Inventory (BK-T).....14.95
Home Inventory (BK-D).....16.95
Checkminder (BK-T).....14.95
Checkminder (BK-D).....16.95
Home Budget (T).....14.95
Home Budget (D).....16.95

SUPERIOR GRAPHICS EMPORIUM

P. O. Box 99715
Tacoma, WA 98499
(206) 845-5903

DEALER INQUIRIES INVITED



"SUPER SLOT"

Vegas action in your own living room. Start with 100 coins and work your way into riches (if you can). Great color, graphics, sound and Vegas action in this-an exciting game for your "64".

$14.95 cassette; $18.95 disk

"CAVERNS OF DOOM"

Explore the vast rooms, passages and mazes in this exciting adventure game. Trying to collect all of the treasures that you can, and travel through all 183 rooms to complete your venture.

$24.95 cassette; $28.95 disk

THE BEST C/64 SOFTWARE YOUR MONEY CAN BUY!

Circle No. 160

M'FILE

Full-Powered Data Mangement System
Easy to use Menu-Driven Screens
Complete numeric and formula capabilities
Versatile Report Generator
Merges to most major wordprocessors
Supports thousands of record-keeping applications

WALLSTREET MICROSCOPE

Detailed fundamental price and financial analysis of common stocks.
Each stock rated against 10 criteria.
Strong buy and sell signals
makes success a high probability.
Available with 10 year history of
Fortune 500 Companies and many more soon.

M'Soft Inc.

SMART

The complete personal system featuring:
Simplified Wordprocessing
Money Management
Amortization - Loans / Savings
Record Keeping - Mail List / Home Inventory
Time Management - Calendar / Scheduling
All Programs load from a Main Menu

MUSICWRITER - 64

Musicwriter - 64 **OUTPUTS SHEET MUSIC**
using high resolution printer graphics!!!
Create - Edit - Play Three Full Voices
Ideal professional tool for:
composers, arrangers,
musicians or vocalists.
Great learning tool for students.

Circle No. 67

Disk Software for the Commodore 64

****

CONTACT: DOUBLE E ELECTRONICS 12027 PACIFIC STREET OMAHA NE. 68154 402-334-7870

News Releases

CORD'S "SUPERCORD" INTERFACE AWARDED U.S. PATENT FOR ABILITY TO LINK COMPUTERS AND TYPEWRITERS

Santa Ana, CA – A new era of expanded possibilities for both computers and word processors has been opened with the granting to Cord Ltd. of Santa Ana, CA of the first United States Patent for a computer-typewriter interface. The design patent is for the Supercord, an interface that links nine different brands of electronic typewriters with at least twenty different brands of computers.

The use of Supercord overcomes a major obstacle in the purchase of either a personal computer or a typewriter. Personal computers either lack a printer or have had to utilize expensive printers which were restricted to use with the computer. Supercord combines the best of both computer and typewriter worlds.

Every popular brand of computer, including Commodore, can be used with the Patented Supercord for connection to a typewriter. The list of electronic typewriters able to use the newly Patented Supercord is equally impressive: Adler, Brother, Royal, Smith-Corona, Silver-Reed, and others. Supercord is offered in a variety of combinations to enable its attachment to specific computers and typewriter models. Whether the computer calls for an RS-232C, an IEEE-488, or a Centronics Parallel interface, there is a Patented Supercord to meet the need. There is even a Supercord II which contains a 4K memory, enabling the computer to receive data input while the typewriter is typing the previously entered data.

Available from Cord Ltd., 1548 Brookhollow Drive, Santa Ana, CA 92705, (714) 545-1643

MICRO-ED WILL DONATE EDUCATIONAL SOFTWARE TO PROMOTE HOME/SCHOOL INSTRUCTIONAL COOPERATION

Micro-Ed Incorporated, a Minneapolis-based publisher of educational software, will donate up to ten thousand dollars worth of educational programs to any *elementary school library* system that can meet certain standards for strengthening home/school cooperation in the area of computer-assisted instruction.

Micro-Ed's President, Thorwald Esbensen, who in 1980 was named by Executive Educator Magazine as one of the one hundred top school executives in North America, had this to say about his company's proposed grant:

"One of the persistent problems for educators and parents has been the development of effective communication channels between home and school. Confronted now with the growth of the home computer market, it behooves boards of education and their administrators to respond vigorously to the challenge of helping families make informed decisions with respect to the proper use of educational software.

"Consider the present situation. Although the initial impetus for purchasing a home computer may have been entertainment value, parents also know that micros can teach, and they want their children to benefit from that fact. What they often don't know is how best to proceed. At this point, the local school system can either offer some helpful guidance, or stand back and let events run their fragmented and spasmodic course.

"Micro-Ed's proposed software grant is designed to encourage the development of an orderly and comprehensive program for dealing with this problem. In part, it envisions the establishment of a free lending library of educational software for families. Important guidance components related to the regular school curriculum would need to be established as well."

Inquiries concerning specific qualifying standards for this grant should be directed to Thorwald Esbensen, President, Micro-Ed., P.O. Box 24156, Minneapolis, Minnesota, 55424. The toll free telephone number is 1-800-MICRO-ED.

FREE COMMODORE 64/PET CATALOG OF EDUCATIONAL SOFTWARE

K-12 MicroMedia's new 28-page Fall 1983 catalog of critically selected educational software and books for the Commodore 64 and PET computers will soon be available. Over 175 recommended items are described and offered on a free 30-day approval basis.

The catalog also contains full details and an official entry form for K-12 MicroMedia's latest $5,000 *Software Give-away Contest.* All 22 prizes, ranging from $50 to $1,000 gift certificates, will be awarded from a random drawing. No purchase is required, but all entries must be postmarked by May 1, 1984 to qualify.

The catalog is available free, upon request. Write: K-12 MicroMedia, Dept. CM, 172 Broadway, Woodcliff Lake, N.J. 07675.

PUBLIC DOMAIN EDUCATIONAL SOFTWARE

The 1983-1984 Educational Public Domain Software for Commodore Computers was released in September by the Ontario Educational Software Project. These programs were provided mainly by educators. The co-ordination was by a volunteer committee of teachers and board computer co-ordinators. This set includes 796 programs on 58 disks which are vastly improved over the previous public domain programs. Machine language is used where necessary for a faster response. Programs with sound perform on the 64 as well as the PET, 4032 and 8032.

Some programs are similar to the original set released last year but improved with machine language routines for speed. Over 15 subjects are covered with the following major categories.

Administration
Computer Science
French
Geography
Logic and Problem Solving
Music
Science
Utilities
Business
English
Games
Language
Mathematics
Physical and Health Education
Technology

Seven grade levels are covered from early childhood to college. Programs are menu driven using drills, simulations and games to provide a fun and interactive path to learning.

These Public Domain Programs are available free through user groups or friends. If you are unable to locate these programs through a user group or other source, they are available from dealers that supply Public Domain Programs and companies specializing in Public Domain Software.

Individual disks or the complete set of 796 programs on 58 disks with documentation are available from: Software Crafts, 405 Fairhaven Dr., Hurst TX 76054. Phone (817) 656-1805.

This set of 58 disks is priced at $325.00.

COMMODORE AND MECC COOPERATE ON QUALITY EDUCATIONAL MATERIALS

West Chester, PA –Commodore Business Machines, Inc. has finalized an agreement with the Minnesota Educational Computing Consortium (MECC) for conversion and marketing of MECC software for the Commodore 64.

MECC will convert one hundred programs in the following subject areas: Biology, Music, Earth Science, Social Studies, Math, Reading, Nutrition, Language Arts, English, Spelling, and Computer Literacy.

MECC is an organization originally established to assist Minnesota schools and colleges in implementing computer based learning. Over the past ten years, it has developed an expertise in the educational computing field while working with educators worldwide. It has applied that expertise to the development of instructional computer programs that are now part of the curriculum in thousands of American schools.

Adaptation of the MECC programs for use with the Commodore 64 will effectively make high quality, educational software available nationwide. For the first time, home users of Commodore computers will be able to obtain the same software that is being used in their schools. The programs are expected to be available on floppy diskettes beginning in the winter of 1983. They will be marketed by both Commodore and MECC through their regular distribution channels.

SCHOLASTIC CREATES A "SOFTWARE HOTLINE" TO KEEP EDUCATORS "SOFTWARE SMART"

New York, NY,–In an effort to keep grade-school teachers up to date on the latest software packages, Scholastic Inc. has created a unique toll-free hotline for educators to provide instant access to new software by way of a computer hook-up. The hotline will supplement Scholastic's *1983-84 Microcomputer Instructional Materials Catalog* which is published annually and mailed to more than 100,000 educators.

The hotline, which is called the *Scholastic Selectronic™ Catalog*, provides a computer menu of new educational software offerings. It can be accessed with any microcomputer and modem by dialing 800-222-0093. This special *Selectronic™ Catalog* is in operation 24 hours a day, 7 days a week. Contact Susan Salzman, Publicity Manager, (212) 505-3477.

PUBLIC DOMAIN SOFTWARE
1983 - 84 EDITION

796 PROGRAMS !
EDUCATIONAL !
USER FRIENDLY !
DOCUMENTATION !
COMMODORE 64 !
PET 4032, 8032 !
58 DISK SET !

COMPLETE SET OF 796 PROGRAMS ON 58 DISKS ONLY $325.00

SOFTWARE CRAFTS
405 FAIRHAVEN DR
HURST, TX. 76054
(817) 656-1805

DEALER INQUIRES WELCOME

This is the best collection of public domain software ever put together. Call or write for more information and listing of over 2000 public domain programs.
COD, mastercard or visa accepted

COMMODORE AND PET ARE REG. TM OF C.B.M. INC.
Circle No. 207

Circle No. 10

BASM

THE BASIC COMPILER THAT'S MORE THAN JUST A COMPILER!

- Are you fed up with slow interpretive BASIC?
- Are you fed up with having to kludge binary into your program?
- Are you fed up with being unfamiliar with assembly?
- **BASM combines the speed and flexibility of assembly with the familiarity of BASIC!**
- **No more awkward binary segments:** BASM handles both BASIC and assembly!
- **Learn assembly language by example:** BASM can list the assembly generated by your BASIC statements!

Atari and **Commodore 64**

COMPUTER ALLIANCE
21115 Devonshire, Suite 132A
Chatsworth, CA 91311
(213) 368-4089

SJB DISTRIBUTORS. ONE STOP SHOPPING FOR COMMODORE SYSTEMS.

commodore

NEW COMMODORE PRODUCTS

Executive 64	$ Call
CBM B128-80	825
B Series Software	Call

WORD PROCESSING 64

NEW - Mirage 80 col.	$ 95
WordPro 3+/Spellright	79
WordPro 3+ (WP)	59
Spellright (Dictionary)	39
Paper Clip	95
Easy Script (D)	35
Easy Spell (D)	19
SPECIAL - Busiwriter (C,D)	39
Quick Brown Fox (R)	49

SPREADSHEETS 64

Calc Result - Advanced (R,D)	$ 120
Busicalc II - More Power! (R,D)	95
Multiplan 64 (D)	79
Calc Result - Easy (R)	70
Practicalc 64 (D)	45
Busicalc I - SPECIAL! (C,D)	39

DATA BASES 64

Mirage Data Base (D)	$ 95
M'File (merges with WordPro) (D)	89
Micro Spec Data Manager (D)	60
Codewriter (develops programs)(D)	95

PRODUCTS OF THE MONTH

TCS 64/80 - NEW! (D) (WP/Data Base/Spread)	$ 139
Koala Pad - NEW!	89
Delta 10 (160 cps) - NEW!	549

UTILITIES 64

Vic Tree (4.0 Basic) (R)	$ 75
64 Super Expander (R)	25
Simon's Basic (R)	25
Cardco Printer Utility (C)	15
MS-Backup (Back Up Data!) (D)	15

ACCOUNTING 64

Home Accountant (Continental)	$ 75
Tax Advantage (merge w/home accountant) - NEW!	45
General Ledger, A/R, A/P, P/R, Inv. (Info Design's Original) (D)	ea.79
Numeric Keypad (Hardware)	65
Numeric Keypad (Cardco)	35

TELECOMPUTING 64

Vic 1650 (Auto Ans/Dial) Modem	$ 95
Vic 1600 Modem	59
Hes Modem (Downloading Software)	65
Super Term (Download/80-128 Form).	95
Micro Term 64 (Download P/D)	39

EDUCATION 64

Spelling I (Koala) (D)	$ 29
Geometric (Koala) (D)	20
I.Q. Baseball (D)	25
Bible Baseball (D)	25
Happy Tutor (Typing) (D)	15

LANGUAGES 64

Instaspeed Basic Compiler (D)	$ 99
Nevada Cobol (D)	55
Pilot (D)	45
Logo (D)	45
Assembler Development (D)	25
64 Forth (R)	40

PRINTERS - DOT MATRIX

Epson RX80 (80 cps)	$ 299
MX80 w/FT (80 cps)	399
FX80 (160 cps)	549
FX100 (160 cps) 14" width	859
Okidata 82A	429
Okidata 92	549
NEC 8023A	429
Star Delta (160 cps)-NEW!	549
Star Gemini 10X (120 cps)	309
Star Gemini 10/15	Call
Transtar 315 (Hi Res., Color)	575
Micro Edge Printer Paper (540 Sheets)	10

ESSENTIALS

Commodore 64	$ Call
1541 Disk Drive	249
1525 Printer (80 col/DM)	225
1530 Datasette	65
1520 Plotter/Printer (4 Color)	169
1526 Printer	Call
1702 Monitor	249

CBM

8032 (80 column Pet)	$ 625
SuperPet (5 languages!)	1049
8050 Dual Drive (1 mg.)	995
8250 Dual Drive (2 mg.)	1295
9060 Hard Disk (5 mg.)	1995
2031, 170K Single Drive	295
64K Upgrade for 8032	259
SuperPet upgrade for 8032	599
4023 Printer (80 cps, 80 col)	395
8023 Printer (150 cps, graphics)	545
6400 Printer (40 cps, LQ)	1450

LETTER QUALITY PRINTERS

Diablo 620, 25 cps	$ 949
Transtar 130, 16 cps - 132 col	769
Transtar 120, 14 cps - 80 col	500

MONITORS

Panasonic CT 160 (color)	$ 279
Panasonic TR120 (w/spkr,green)	155
Sanyo/Amdek-Green, No Audio, 12"	125
BMC/Sanyo-Green, No Audio, 9"	95
Cable (For Above) A/V	15

VIC ACCESSORIES

8K RAM Expand. Cart	$ 40
16K RAM Expand. Cart	70
24K RAM Expand. Cart	105
27K RAM (Expands Vic to full 32K)	119
3 Slot Expander	30
6 Slot Expander	70
Joystick (Wico-Red)	25
Joystick Blaster (ADR Rapid-Fire)	10

INTERFACES & ACCESSORIES

Data 20 80-Col. Exp.	$ 159
Mr. Computer 80-Col. Exp.	60
5-Slot Exp. (64)	65
Vic Switch (connect 8 64's or Vic's to DD/Printer)	145
Cables 3M, 6M, 12M for above	Call
Verex (Box of 10) 5¼ Diskettes	26
Connection(Pet/64 graphics,2K Buffer)	99
Cardco Print + Graphics	85
Cardco Cardprint	70
MW 302 Parallel	65
PET/IEEE Cable (1m)	33
IEEE/IEEE Cable (1m)	49
Interpod (Intelligent IEEE, RS232, serial)	149
ADA 1800 (IEEE/Parallel)	129
ADA 1450 (IEEE/RS232 (M/F))	129

VISA/MASTERCARD
MONEY ORDERS
BANK CHECK

C.O.D.'s Accepted. (Add $5)
In stock items shipped within 48 hours.
F.O.B. Dallas, Texas (Texas Res., Add 5% Tax).
Products shipped with manufacturer's warranty.
Prices subject to change without notice.
$50 Minimum Order.

*Defective units **must have** return authorization number and include copy of invoice.

SJB DISTRIBUTORS INC.
10520 Plano Road, Suite 206
Dallas, Texas 75238

TO ORDER
CALL TOLL FREE
800-527-4893
800-422-1048
(Within Texas)

CATALOG
Send Postcard with Name & Address to speed processing.

Circle No. 60

NOTE: SJB HAS A FULL LINE OF COMPUTER MEDIA IN STOCK, CALL OR WRITE FOR MORE INFORMATION.

Software Reviews

FORM MAKER FOR SMALL BUSINESSES

Reviewed by Dennis Kelley

Form Generator, as the name implies, is a program to make and calculate forms. It can create mail lists, sales receipts, statements, invoices, etc. Any form can be produced, calculated and printed–one copy or many.

The program operates in much the same way as a spreadsheet. It is organized by defining "cells" which contain Constants, Inputs or Formulas. Cells can also be repeated.

The format for each cell can be selected as either numeric or text. The cell is then positioned simply by assigning a number, for example, entering the number 50.12 will print the information on line 50 at column 12. Labels such as "Quant * Price" are applied to the numeric cells and are used for formulas. The program can multiply, divide, add, subtract and sum.

A master menu of commands makes the program easy to use, and Technical Notes are available which help the user enhance and customize it.

Control of print format is limited to setting margins, number of columns, lines per page and number of copies. Non-Commodore printers can be used with a compatible interface, but features such as doublestrike or condensed print are not supported. Adding a printer set-up routine is a good place for the user to start modifying the program.

Once a form has been designed it can be saved to either tape or disk. Forms can be retrieved, and data that had been saved with the form can be retained on default.

Documentation consists of seven pages of instructions and examples, along with two sample files, Pricetag and Invoice. Pricetag is simply a pricelist with a retail price and a calculated discount price. Invoice is noteworthy because the instructions say it demonstrated every feature of Form Generator.

Sim Computer Products offers this program on each cassette/disk for both the Commodore 64 and the VIC-20 + 8K (16K expansion is recommended).

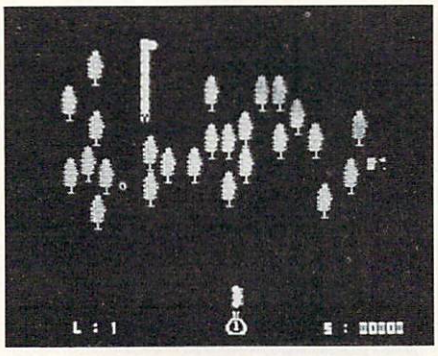
Performance is outstanding for such an inexpensively priced program.

"Form Generator"
SIM COMPUTER PRODUCTS, INC.
1100 E. Hector St.
Whitemarsh PA. 19428
Commodore 64/VIC-20 + 8K
Tape $29.95 Disk $34.95

A DEBUGGER GAME

Reviewed by Robert T. Parr

Killer Piller is a high-resolution arcade-type game from Castle Software. It comes on tape or disk for the Commodore-64, and requires a joystick.



The theme of Killer Piller is similar to that of the arcade game Centipede. You control a "bug sprayer" that moves horizontally and vertically along the bottom of the screen. The "killer piller" moves across the screen, eating as many of the trees that make up your "orchard" as it can. As it eats up trees, its body gradually gains segments. Every now and then, it will lay eggs in the orchard, which eventually turn into moths that attack your sprayer. By pressing the fire button on the joystick, you are able to "spray" the bugs. If you "spray" the piller in one of the middle segments of the body, then it will split. You can eliminate the moths by hitting them with a shot from the sprayer. If the piller eats up all of your trees, or you get hit too many times by the moths, then you lose.

There are 7 screen levels and 2 difficulty levels. You are given 3 sprayers per level while in the Novice setting, but the Advanced level allows only 3 sprayers per game. However, bonus sprayers are awarded at 20,000 and 70,000 points. I like the difficulty option, as it allows beginning players to achieve some success, but maintains a challenge for more skilled players.

The game will pause if any key is pressed, then restart with another keystroke. Player movement is very responsive. The bright graphics and sound effects are some of the best I have seen for the C-64.

Overall, I feel that Killer Piller is a very well written game that should provide entertainment for many Commodore 64 owners.

"Killer Piller"
CASTLE SOFTWARE
P.O. Box 350
New Castle, DE 19720
Commodore 64 (Joystick required)
Cassette $9.99 Disk $12.75

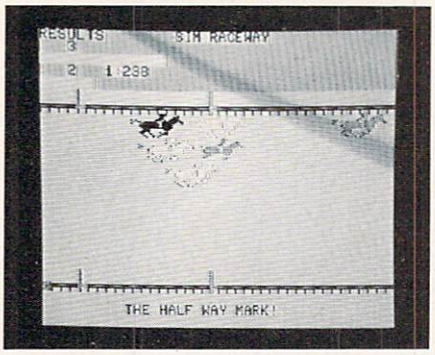
A DAY AT THE RACES

Reviewed by Dennis Kelley

Kentucky Derby is a new game which takes you and your friends (up to three) to the track. You make your bets to win, place or show after examining the odds. If you are undecided, the program even has

a help feature where you can get advice from Hot Tip Sam.

When all the bets are down, you hear the familiar "Call to the races" trumpeted and then the six horse field is off with a gallop.



The sound and graphics realistically simulate a horserace with the jockeys changing lanes and some horses falling back while others advance. Heading into the fourth turn, you begin to anticipate your horse making his move for the final stretch. As the horses cross the finish line you start doing the mental arithmetic on how much you won or how much you'll have to bet in the next race to get even.

Your math doesn't have to be perfect, since the program automatically calculates your winnings (or loses) at the end of every race and adjusts your bank. You start the game with $100 and you can borrow from the track, but be forewarned that Hot Tip Sam is not the most reliable of touts.

An unusual feature of this Inside Basic series of programs from Sim Computer Products is a promise to mail you Technical Notes when you send in the owner registration card. Armed with a program overview, suggested changes, user instructions and variable charts, you are encouraged to customize and expand the program.

Graphics and sound are nicely implemented and are very similar for both the expanded VIC-20 and the C-64 versions. Each disk or cassette contains both versions, so if you upgrade from VIC to 64, you can still spend the day at the track.

"Kentucky Derby"
SIM COMPUTER PRODUCTS, INC.
1100 E. Hector St.
Whitemarsh, PA 19428
Commodore 64/VIC 20 + 8K
Tape $19.95 Disk $24.95

FLY Your Computer

FLIGHT SIMULATOR GAMES

Sky Pilot (8K VIC-20)	**$18.00**
Runway 20 (16K VIC-20)	**$25.00**
Runway 64 (Commodore 64)	**$25.00**
Micro-Pilot (EPSON HX-20)	**$18.00**

ADD $2.00 FOR DISK VERSION

TORPEDO!

Submarine Battle Games
8K VIC-20 or Commodore 64 **$25.00**

SUSIE SOFTWARE
709 Wilshire Dr. Mt. Prospect, IL 60056
(312) 394-5165
Circle No. 149

SKYLIGHT SOFTWARE
22 B MILLER STREET, BELFAST, MAINE 04915
(207) 338-1410

CBM-64 SOFTWARE

EPYX/AUTOMATED SIMULATIONS

JUMPMAN: 30 Different Screens, Climb Jump Fall, Great Action Game.. **$33.99**
CRUSH CRUMBLE & CHOMP: Action Arcade Game..... **$33.99**
TEMPLE OF APSHAI: Graphic Fantasy Adv., Create & Equip your Character **$33.99**
UPPER REACHES OF APSHAI: Add New Challenges to Temple Adventure.. **$17.99**
SWORD OF FAGOAL: New graphic adv. from the author of Temple of Apshai **$33.99**

SPINNAKER

FACEMAKER: Kids design a face & make it do all kinds of neat things.. **$29.99**
KINDERCOMP: Young Children Match Shapes & Letters, Draw Pictures.. **$24.99**
STORY MACHINE: Computer Animates Child's Story on the Screen... **$29.99**
HEY DIDDLE DIDDLE: 30 Classic Rymes with Full Color Graphics..... **$24.99**
IN SEARCH OF THE MOST AMAZING THING: Graphic adventure for kids.. **$32.99**
SNOOPER TROOPS I: Kids Learn As They Solve The Puzzle..... **$38.99**

SYNAPSE SOFTWARE

PHAROAH'S CURSE: Avoid Rama's Ghost & Find Lost Treasure, Vic/64.. **$29.99**
SURVIVOR: Multi-Player Cooperative Space Adventure, Vic/64.... **$29.99**
SHAMUS: Four Levels of 32 Rooms, Adventure Game, Vic/64..... **$29.99**
FT. APOCALYPSE: Fly Helicopter & Capture Fuel & Weapons, Vic/64.. **$29.99**
PROTECTOR II: Get Your People to SAfety as Volcanoes Erupt, Vic/64 **$29.99**

— NEW FROM STAR MICRONICS —
80 COLUMN THERMAL PRINTER
NOW, A PRINTER THAT YOU CAN AFFORD. 60 CPS; Friction Feed; Block Graphics; Bi Directional Print Head; ASCii + European characters.
ONLY $154.99 Plus $8.00 Shipping and Handling
GEMINI-10 PRINTER ONLY $299.99 Plus $10.00 S-H

AVALON HILL GAME COMPANY

MIDWAY: Recreate This Important WWII Naval Battle On Your Screen.. **$13.99**
NUKEWAR: Retaliate Against Enemy 1st Strike, Can You Get Through **$13.99**
B1 BOMBER: Strategic Attack on Enemy Homeland, A Real Spine Chiller.. **$13.99**
TELENGARD: Dungeon Fantasy Adv., You'll be weeks mastering this one.. **$21.99**
T.G.I.F.: Had a Hard Week at the Office? Unwind With This..... **$21.99**

HES

HESMON 64: Machine Language Monitor for the C-64..... **$33.99**
HES WRITER 64: Simple Word Processing on a Cartridge..... **$36.99**
TURTLE GRAPHICS II: Simple Graphic Language Teaches Kids Programming.. **$48.99**
GRIDRUNNER: You've never seen so much action on your screen, 30 levels **$33.99**
RETROBALL: Fast Action Arcade Game..... **$33.99**
HES MODEM: Direct connect Modem incl. Midwest Micro's term software.. **$64.99**

WE HAVE COMMODORE'S COMPLETE EDUCATION LIBRARY FOR THE PET/CBM-64. OVER 600 PROGRAMS ON 50 DISKS. ONLY $9.99/ DISK. SEND $2.00 FOR 18 PAGE CATALOG.

— MISCELLANEOUS —

GAMES ON THE COMMODORE 64: Book of Basic Listings for Games.. **$13.99**
KIDS AND THE COMMODORE 64: The best basic learning guide for kids.. **$17.99**
THE ELEMENTARY COMMODORE: Learn the Basics of Commodore Basic.. **$13.99**
DAVID'S MIDNIGHT MAGIC: Pin Ball like you've never seen before.. **$29.99**
ROBBERS OF THE LOST TOMB: Graphic Adventure Game..... **$21.99**
WALL STREET: Stock Market Simulation..... **$21.99**
MONEY MANAGER: Plan & execute a budget with help from your 64.. **$21.99**
ELECTRONIC CHECKBOOK: Balance Your Checkbook Automatically.... **$21.99**
DATA MANAGER: Use For Lists Inventories, Etc..... **$21.99**
PAPERCLIP: Professional Word-Processing-Horizontal Scroll..... **$109.99**
DELPHI'S ORACLE: Powerful Data Base, Up to 8000 Char/Record.. **$128.99**
WRITER'S ASSISTANT: Powerful Disk Based Word Processor .64 $59.99
FILING ASSISTANT: Data Management for all your needs .64 $69.99
SPREADSHEET ASSISTANT: Visi-type software for the 64 $59.99
COMMODORE LOGO: Similar to Apple logo .64 $49.99
VANILLA PILOT: Easy to use language. VIC or 64 $27.99
PET EMULATOR: Run many PET programs on 64 $19.99
BUSINESSMAN BYCMS: General Ledger, Runs on 1 Disk.. 64 .....
BILL PAYER BYCMS: Accounts Payable, Aging Reports, Print Checks
BILL COLLECTOR BYCMS: Accounts Receivable, Print Statements...
PAYMASTER BYCMS: Payroll System, Print checks, Payroll register
$ 89.99 EACH
Circle No. 38

VIC-20 SOFTWARE

BRODERBUND SOFTWARE

A.E.: Giant Robot Stingrays Attack In Waves, A Graphic Masterpiece **$31.99**
SEAFOX: Classic Submarine Versus Surface Ship Battle..... **$31.99**
SKY BLAZER: New Action Space Adventure..... **$31.99**
MARTIAN RAIDER: Intergalactic Ships In Attack On Mars..... **$16.99**
SHARK TRAP: Snare The Sharks In Your Atomic Net Or Die..... **$16.99**
MULTI SOUND SYNTHESISER: Create Your Own Compositions..... **$16.99**

SIERRA ON-LINE SYSTEMS

CANNONBALL BLITZ: Climb Thru 3 States of Action to Defeat Red Coats.. **$31.99**
CREEPY CORRIDORS: Action Graphic Adventure..... **$28.99**
JAWBREAKER II: Everything Moves Even The Walls..... **$28.99**
LUNAR LEEPER: Rescue Your Friends & Head For The Eye..... **$31.99**
THEASHOLD: Survive 24 Levels of Intruding Aliens..... **$31.99**
CROSSFIRE: Defeat Surrounding Aliens with Dwindling Ammo. Vic/64 **$16.99**
FLIP-N-MATCH: Concentration For The VIC..... **$16.99**
ULTIMA-ESCAPE TO MT. DRASH: Graphic Adventure..... **$16.99**

SKYLIGHT SOFTWARE
TAPE #1 – Canon Duel – Breakout – Runaround – Stockcar
TAPE #2 – Target Pistol – Space Duel – B29 – Tank – Roadblock
TAPE #3 – Sub Hunt – Blockade – Indy 500 – UFO – Jungle Driver
VIC TAPES $9.99 ea 15 GAMES ON ONE TAPE $19.99
NEW! COMMODORE 64 LIBRARY-DISK ONLY....$19.99
BOMBER — POKER — BLACKJACK — 3D MAZE — TREASURE ISLE ADV — 64 DATA MANAGER — SPRITE AID
FLIGHT SIMULATOR — 3 MILE ISLAND

T & F SOFTWARE

WORD SEARCH: Find Hidden Words, 3 Different Categories..... **$16.99**
SPORT SEARCH: Hidden Words, Pro Teams College Teams Games.... **$16.99**
ARCADE SEARCH: Hidden Words, 3 Categories..... **$16.99**
CHECK EASE: 16 Budget Cat. Multiple Accounts-Reconcile..... **$20.99**

IMAGIC

DEMON ATTACK: Destroy The Demons Attacking The Moon..... **$31.99**
ATLANTIS: Defend Underwater City From Gorgon Attack..... **$31.99**
NOVA BLAST: Defend 4 Capsuled Cities, Beam Fuel & Shields..... **$31.99**
DRAGONFIRE: Cross Bridge Dodging Dragonfire — Avail. Oct. '83.. **$31.99**
MOONSWEEPER: Rescue Miners Trapped on Jupiter Moons. Avail. 11/83 **$31.99**
FATHOM: Find Neptunes Trident; Rescue Mermaid, Avail. Nov. 83.. **$31.99**

ROMOX

PRINCESS AND FROG: Like Frogger — Great Graphics & Animation.. **$31.99**
ANTEATER: Get Food Back To Your Colony & Destroy Anteater..... **$31.99**
TYPO: Increase Word Power & Typing Skills — Action Game..... **$31.99**
HENPECKED: Rule The Roost Or Be Hen-Pecked..... **$31.99**
WHIZ KID: Combines Fast Ice Hockey and Learning..... **$31.99**

— MISCELLANEOUS —

QUICK BROWN FOX: Professional Word Processing Cart VIC/64 **$49.99**
TOTL TEXT 2.0: Cass. – Basic Word Processor VIC/64 **$19.99**
TOTL TEXT 2.5: Cass. – Advanced Word Processor – Req. 8K Exp.. **$29.99**
TOTL LABEL: Cass. – Mailing List..... VIC/64 **$16.99**
RESEARCH ASSISTANT: Cass.–Notekeeping for Term Papers, etc.. **$24.99**
ROAD TOAD: Cass. – Like Frogger..... **$16.99**
MILLIPEDE: Cass. – Like Centipede..... **$16.99**
HANGMAN: Classic Word Game With Graphics..... **$8.99**
METEOR: Like Asteroids..... **$9.99**
SKI RUN: Downhill Racing Slalom Racing..... **$16.99**
KOALA PAD: Touch pad w/ disk based software to draw hi-res pictures.. **$84.99**

— WICO —

JOYSTICK: Bat handle–2 fire buttons–6 leaf switch assembly . **$ 24.99**
REDBALL JOYSTICK: Heavy duty version of above ..... **$ 29.99**
JOYSTICK DELUXE: Rugged heavy duty-arcade quality ..... **$ 33.99**
TRACKBALL: Phenolic ball– 360 deg. movement–Arcade quality **$ 54.99**
12 FOOT EXTENSION: Extend cord of any Atari-type controller . **$ 7.49**

— CARDCO —

CARDBOARD/6: 6 Slot Expansion..... **$79.99**
CARDPRINT: Parallel Printer Interface for Vic or 64 ..... **$64.99**
CARDRITER: Light Pen with 6 good programs, Vic or 64 ..... **$31.99**
CARDADAPTER: Play Atari VCS Games on your Vic..... **$74.99**
CARDBOARD/3S: slot exp.-fused-switched-reset button..... **$31.99**
CARDETTE/1: Use standard cassette recorders on VIC..... **$31.99**

ADD $2.00 FOR SHIPPING & HANDLING
MasterCard VISA
PRICES REFLECT CASH DISCOUNT ADD 3% FOR CREDIT CARDS
(Please include all Card Information)
5% tax for Maine residents
SEND FOR FREE LIST OF OVER 200 ITEMS
PLEASE SPECIFY VIC-20 OR COMMODORE-64

BASIC ELECTRONIC BUSINESS SYSTEMS, INC.

SOFTWARE FOR 8032 OR 4032 WITH 2031, 8050 OR 4040
COMMODORE 64 WITH 1541

General Ledger
300 Chart Accounts * 700 J/E * Detail G/L & Income Statement * Budget Variance Statement * Trial Balance * Cash Flow Analysis * Balance Sheet Journals *

Payroll System
300 Employees YTD * Employee Wage Analysis * Employee Time Card Lists * W-2 Forms * 941 Reports * Pre-Payment Register * Labels Work Comp. Report & Check Register * Payroll Checks * 50 Hourly Employees *

Accounts Payable
Open Invoices (300) * Vendor Report * Purchases Journal * Pre-Payment Register * Cash Need Projection *

Accounts Receivable
Customer List (300) * Sales Journals * Customer Sales History * Statements * Labels * Open Invoice (300) * Invoice Income Projection *

Inventory
Quantity On Hand * Quantity Purchased * Quantity Sold, "S" Purchased & "S" Sold (MTD & YTD) * Inventory Alert * Valuation (Retail & by last cost) * Listing by part number * Limit 999 per disk *

The above for 8032 or 4032	$129.00 ea.
The above for C-64	$ 79.95 ea.
All for 8032 or 4032	$495.00
All for C-64 with 1541	$295.00

Each module includes the logic to allow posting to the G/L. Each module may be used as a stand alone system or a total system. Please specify format.

Client Accounting
Everything a bookkeeper needs to keep books for a typical small business client. Includes all features on G/L plus the ability to produce disbursement registers, 941-B Forms and W-2 Forms.

The above for 8032 or 4032	$179.00
The above for C-64	$129.95
BMC BX Printer (80 cps dot mat.)	$299.00
BMC PB-401 Daisy Wheel-16 cps	$729.00
The Connection (printer interface) for C-64 or VIC 20	$ 89.00
Printer Interface for 8032-4032	$149.00
Amdek Color I[5] with cable	$299.00
BMC Color Monitor with cable	$249.00
Model 1540 to 1541 Rom converter	$ 64.95
Commodore 8032 Computer	$619.00
Commodore 8050 Disk Drive	$975.00

TO ORDER CALL (713) 530-2515 Circle No. 68
M.C. or Visa Add 3%
B.E.B. SYSTEMS, INC.
11430 Bissonnet, C-7, Houston, TX 77099
DEALER INQUIRIES INVITED

COMMODORE 64 SOFTWARE

GAMES		
HUNTER/KILLER graphic submarine adventure (T&D)	reg. 19.95	now 14.95
JUMPMAN 30 screens-best arcade game yet (T&D)	reg. 33.95	now 28.95
JUMPMAN JR (Cart)	reg. 39.95	now 28.95
ESCAPE MCP fantastic maze game 10 screens (T&D)	reg. 23.95	now 19.95
SUPERCUDA multi screen Pac-man type game (T&D)	reg. 23.95	now 19.95
PEGASUS ODYSSEY colorful-graphic-challenging (T&D)	reg. 23.95	now 19.95
OMEGA RACE popular arcade game comes home (T&D)	reg. 19.95	now 16.95
BUSINESS		
DATA BASE MANAGER up to 1200 files per disk	reg. 99.95	now 79.95
GENERAL LEDGER can chart up to 350 accounts	reg.149.95	now 99.95
ACCOUNTS REC. interactive with a/p, gl & payroll	reg.149.95	now 99.95
ACCOUNTS PAY interactive with a/r, gl & payroll	reg.149.95	now 99.95
PAYROLL interactive with a/r, a/p, & gl	reg.149.95	now 99.95
EASY SCRIPT word processor	reg. 69.95	now 49.95
UTILITIES		
ASSEMBLER 64	reg. 29.95	now 19.95
LOGO	reg. 69.95	now 59.95
PILOT	reg. 69.95	now 39.95
HOME UTILITIES		
ELECTRONIC CHECKBOOK	reg. 29.95	now 24.95
FORGET-ME-NOT electronic calendar	reg. 24.95	now 19.95
MONEY MANAGER budget planner	reg. 24.95	now 19.95

Send check or money order. COD add $2.00. Shipping $1.50

278 Warren Street
Edgewater Park N.J. 08010
Tel. 609-386-9353

pyramid computerware

Circle No. 140

COMMODORE OWNERS

Join the world's largest, active Commodore Owners Association.

- **Access to thousands of public domain programs on tape and disk for your Commodore 64, VIC 20 and PET/CBM.**
- **Monthly Club Magazine**
- **Annual Convention**
- **Member Bulletin Board**
- **Local Chapter Meetings**

Send $1.00 for Program Information Catalogue.
(Free with membership).

Membership Fees for 12 Months	**Canada**	**— $20 Can.**
	U.S.A.	**— $20 U.S.**
	Overseas	**— $30 U.S.**

Toronto Pet Users Group Inc.
Department "D"
1912A Avenue Road, Suite 1
Toronto, Ontario, Canada M5M 4A1

*** LET US KNOW WHICH MACHINE YOU USE ***

VIDEO INSTRUCTION TAPES!

STEP BY STEP INSTRUCTIONS

USE YOUR VCR SIDE BY SIDE WITH YOUR COMPUTER TO LEARN HOW TO PROGRAM IN BASIC AND HOW TO USE THE 1541 DISK DRIVE. WHY SPEND DAYS WITH A MANUAL WHEN YOU CAN LEARN MORE IN A FEW HOURS WITH YOUR VCR. REVIEW AND LEARN AT YOUR OWN PACE.

PICTURES ARE WORTH THOUSANDS OF WORDS AND SAVE HOUR OF FRUSTRATION

Programming BASIC V.I.S. tape includes:
Shows basic language programming, using commands such as IF, READ, DATA, LET, GOTO, INPUT, etc. Instruction proceeds to intermediate level with commands such as LEN, MID$, LEFT$, RIGHT$, CHR, etc.
Also demonstrates advanced logical and mathematical functions. Includes example programs.

CAT #	TOPIC	APPROX RUN TIME
BP-3	LEARNING C-64 BASIC	2 HR
BP-4	LEARNING VIC-20 BASIC	2 HR
DIO-1	COMMODORE 64 DISK I/O	1 HR 45 MIN
DIO-2	VIC 20 DISK I/O	1 HR 45 MIN

Disk I/O Tapes include RANDOM, RELATIVE, SEQUENTIAL disk read and write. Also explains load, save, new, copy, scratch, initialize, validate, error channel, command channel, and rename in both the standard and wedge syntax. Explains the verify, open print #, input #, get #, status BAM commands. Lesson includes several programs and a large checkbook program.

VHS or BETA FORMAT ONLY $49.95 EACH TAPE

FLOPPY DISK STORAGE UNIT
PROTECT 'N' STORE

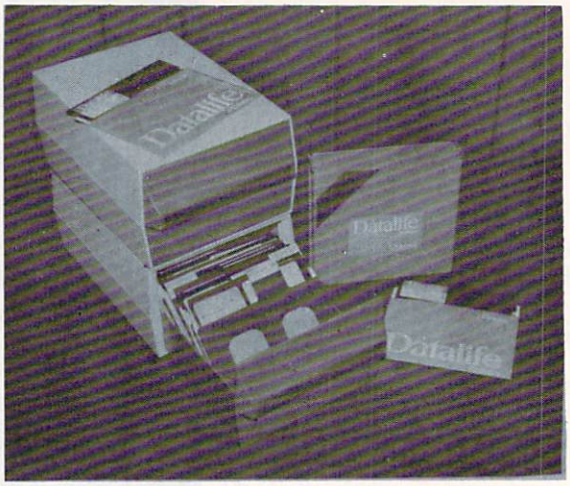
- ★ 7 PLASTIC DIVIDERS
- ★ MODULAR DESIGN
- ★ STACKABLE
- ★ LABLES INCLUDED
- ★ STORES 30 5" DISKETTES
- ★ **$19.95 EACH** Retail Price

ORDER 1 FOR **$19.95**
GET 2ND FOR **$ 9.95**

2 FOR ONLY **$29.95**

A $39.90 VALUE!

DEALER INQUIRIES WELCOME



UNIQUE DESIGN WITH PULL OUT DRAWER FOR FILING EASE

VERBATIM DATALIFE

5¼ IN DISKETTES
5 YEAR WARRANTY
DOUBLE DENSITY
SINGLE SIDED

ONLY
$25.00
BOX OF TEN

Orders taken 9:00 a.m. - 6:00 p.m. Central Time Add $3.00 per order for shipping and handling

LYNN COMPUTER SERVICE

6831 West 157th Street Tinley Park, Illinois 60477
(312) 429-1915

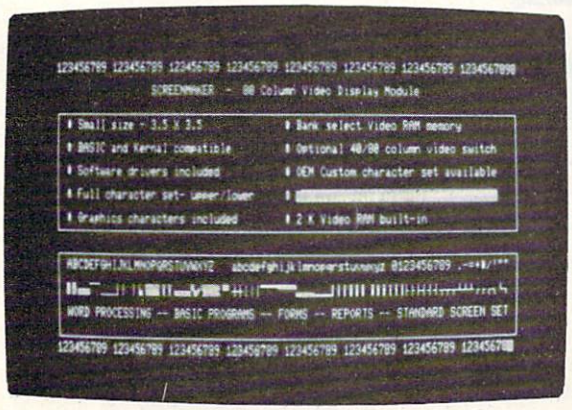
master charge THE INTERBANK CARD
BANKAMERICARD VISA

VIC-20 AND COMMODORE 64 ARE TRADEMARKS OF COMMODORE BUSINESS MACHINES, INC.

Circle No. 70

80 COLUMNS!
25 LINES!

A FULL PROFESSIONAL DISPLAY
for
Commodore 64
with
Screenmaker™
VIDEO DISPLAY GENERATOR



Screenmaker™
$149.95

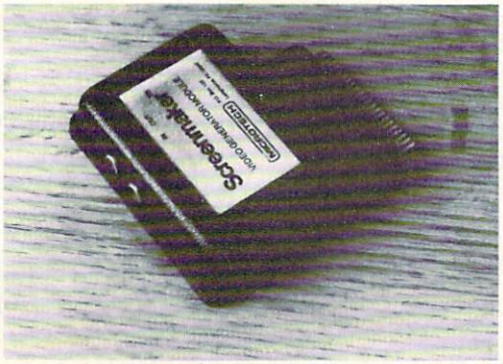
Copy-Writer™
WORD PROCESSOR
$79.95

Combination –
Screenmaker™ and Copy-Writer
$199.95

Screenmaker™ is a video display generator module that plugs into the expansion port of the Commodore 64. It provides a full 80 characters on each line of the display. With Screenmaker™, video displays will appear the same as printer output. Twice the information is available on the screen. Word Processing is easier. Trial printouts are eliminated. Forms and reports can be setup faster.

WORD PROCESSING WITH 80 CHAR/LINE

Copy-Writer™ is a full feature professional WORD PROCESSOR designed to work with the Screenmaker™ video generator module. This combination provides a full professional display as well as the features of the best word processors and more. This includes full screen editing, double columns, shorthand, left margin, right margin, centering, a variety of paging controls, page size controls, footers, headers, auto page numbering, special printer feature control, graphics capability, and more! Copy-Writer™ is written in FORTH and has a large text buffer allowing over 700 (40 col.) lines in memory.



Circle No. 6

cgrs **MICROTECH**

P.O. Box 102
LANGHORNE, PA 19047
215-757-0284

DEALERS – CALL US! WE HAVE A DEAL FOR YOU.

American Made Software Co.
P.O. Box 4137
Irving, Texas 75061

VIC-20 & C-64 HARDWARE

LIGHT PEN $17.95
The RIGHT Pen at the LIGHT Price! (VIC-20 or C-64, Disk or Tape)

DATA PAD $44.95
Sixteen keys, all programmable, Driver uses only 300 bytes! The most versatile Pad at ANY Price! (VIC-20 or C-64, Disk or Tape)

PORTA-START $14.95
End the disappointment of locked up Programs forever! Just Press the built in reset button, load and run the included Program, and your Program is back and ready to go! (VIC-20 or C-64, Disk or Tape)

NEW! C-64 EXPANDO-BOARD NEW!...$39.95
Four slots, switch selectable, gold contacts! (C-64 only)

VIC-20 SOFTWARE

MASTER MIND $9.95
Great Puzzle! (13k, Dick or Tape)

STAR TREK $9.95
Oldest adventure game! (13k, Disk or Tape)

CHECKMINDER $12.95
Manage your checkbook. (13k, Disk or Tape)

NEW! PERSONAL DATABASE NEW! $19.95
Keep all your records straight! (13k, Disk or Tape)

NEW! PERSONAL LEDGER NEW! $19.95
Manage a home business! (13k Disk or Tape)

C-64 SOFTWARE

REVENGE OF THE KLINGONS $19.95
Beautiful graphics, startling sound, a great one! (Disk or Tape)

STARGUARD $14.95
Real outer space shoot em up! (Disk or Tape)

MASTER MIND $14.95
Great Puzzle! (Disk or Tape)

NEW! PERSONAL DATABASE NEW!....$19.95
Keep all your records straight! (Disk or Tape)

NEW! PERSONAL LEDGER NEW! $19.95
Manage a home business! (Disk or Tape)

NEW! INVENTORY CONTROL SYSTEM NEW! $44.95
A very thorough inventory for a small to medium sized business (Disk only)

NEW! PAYROLL MANAGEMENT SYSTEM NEW! $44.95
Handles all facets of your payroll. Taxes, overtime, Printed reports, W2's, Paychecks, and more! (Disk only)

All our Products come with a written lifetime warrantee!

Visa, Master Card, Check, or Money Order Gladly Accepted!
C.O.D.'s add $2.00 for handling

Send $1.00 $ SASE for Catalog.

Circle No. 161

NEW PRODUCTS

These items are selected from the large number of product announcements sent to us by manufacturers and advertisers. They are presented solely as an informational service to our readers, and do not necessarily constitute product endorsements or recommendations.

DON'T LAUGH

Silly Industries of Sherman Oaks, California, announces the release of its new "Silly Software" line. Silly Software is "non-functional, non-competitive and non-useful–its only purpose is to entertain," according to Silly Executive Tom Hensley.

Hensley, who doubles as a pianist, arranger and songwriter for singer Neil Diamond, described the firm's first release "Silly 64", as "a sort of Silly Sampler of what the silly people here are up to."

It includes such options as "Sillypoem", which creates random poetry using operator input; "Silly data", which screens a series of meaningless but impressive graphs; "Sillycrisis", which simulates the destruction of the computer; and "Annoying Repetitious Message", which is just what the name implies.

Hensley declined to elaborate on future Silly Software releases, because "there may be people out there who are silly enough to want to steal our ideas," but indicated that "we intend to get stranger as we go along."

He also stressed that Silly Software is only available for the Commodore 64. "Anyone who would buy an Apple or one of the other overpriced dinosaur computers in this day and age has reached a transcendental level of silliness that's way beyond anything we have to offer," he noted.

Silly 64 is priced at $19.95 and is exclusively distributed on this planet by DES-SOFT, a division of DES Data Equipment Supply, 8315 Firestone Boulevard, Downey, California 90241.

Hensley pointed out that many companies were screened before the choice of DES was made. "We wanted a company located in a silly-sounding town, and Downey was a logical choice," he pointed out.

Circle No. 250

PRACTICALC PLUS™ FOR VIC-20

Computer Software Associates of Randolph, MA has announced the availability of PractiCalc Plus, a spreadsheet program for the VIC-20. Requiring a 16K RAM expander, this second generation of PractiCalc offers the advanced functions of high resolution graphics and an inherent data base manager.

PractiCalc Plus allows the user to have numbers instantly converted into histograms (bar graphs) by depressing a single key.

The built-in data base manager allows for sort and search routines, arranging data in numerical or alphabetical order, maintaining and searching files of customers, phone numbers, recipes, etc.

PractiCalc Plus is useful for preparing budgets and business projections; keeping track of expenses, investments and inventory; detailing salespersons' activities, etc. It carries a suggested retail price of $49.95 in both tape and disk formats. For additional information contact:

Micro Software International, Inc.
The Silk Mill
44 Oak Street
Newton Upper Falls, MA 02164
(617) 527-7510

Circle No. 251

STOCK BRIEF-64

A disk-based filing system for recording securities transactions on C-64, CBM 4032 and 8032 has seven User Friendly commands: BUY–SELL–VALUATE–EDIT–LIST–DIRECTORY–QUIT, with automatic file updating and hard copy available on all transactions. It supports multiple files with easy disk directory, computes dividend yield, and allows current stock prices to be entered to see "results if" shares were to be sold.

Price: $50.00 Post Paid. Available from:
MYSTIC SOFTWARE
P.O. BOX 25
MYSTIC, CT 06355

Circle No. 252

PASCAL FOR C-64 FROM ABACUS

For those C-64 owners who have been waiting for the popular Pascal language, Abacus Software brings you ZOOM Pascal 64.

This version is fast running because it produces 6502 machine language, not P-code, and gives you the programming convenience of a structured high-level language. Data types include floating point reals, integers, strings and scalars. You can access conventional text files on disk or tape.

The ZOOM Pascal 64 package consists of:

- EDITOR - so you can create, save and modify your Pascal source language statements
- COMPILER - to translate the Pascal source language statements into intermediate code
- TRANSLATOR - to translate the intermediate code into actual 6502 machine language
- Comprehensive user's manual

- Sample programs to show you how to get the most from ZOOM Pascal 64

ZOOM Pascal 64 only on diskette for $39.95. Available from your local dealer or directly from:

ABACUS Software
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510 Circle No. 253

BEHIND THE 8K BALL

POOL brings the billiard parlor to your home without the smoke-filled room. Written for either the C-64 or VIC-20 (with 8K expander), POOL uses high resolution graphics, and allows you to play either nine-ball or straight-pool. You control the speed and angle of the cue ball from the keyboard. Take your shot, watch the balls roll and then listen to the clatter as they hit each other.

POOL-64 or POOL-20 on cassette ($14.95) or diskette ($17.95). Available from your local dealer or directly from:
ABACUS Software
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510 Circle No. 254

BOOK FOR THE COMMODORE 64

The ANATOMY OF THE COMMODORE 64 is aimed at Commodore 64 owners who want to better understand micros. It is a 300-page, detailed guide to the lesser known features of the C-64.

Here's an outline of the contents:

1. Machine Language Programming on the Commodore 64.
2. The Next Step–Assembler Language Programming
3. A Close-Up Look at the Commodore 64
4. Music Synthesizer Programming
5. Graphics Programming
6. Basic From a Different Viewpoint
7. Comparison of the VIC-20 and the Commodore 64
8. Input and Output Control
9. ROM Listings

Soft cover $19.95. Available from your local dealer or directly from:

ABACUS Software Circle No. 255
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510

VARIETY FROM ARFON

Arfon Micro announces the release of three new programs for the VIC-20 and Commodore 64.

MicroBase is a data base and mailing label/report generator for the VIC-20 and Commodore 64. It allows up to 12 fields per record, up to 80 characters per field, and up to 176 characters per record. It allows you to sort by any field using any of seven different alpha, numeric, or character match parameters. With MicroBase you will be able to print mailing labels, reports, inventories, and more. Suggested retail prices are $29.95 for cassette and $34.95 for disk.

Microterm 64 is a terminal communications program for the Commodore 64. With Microterm 64 you will be able to download incoming files to disk, tape, or printer, and upload and transmit files from tape or disk. Suggested retail prices are $39.95 for cassette and $44.95 for disk.

Baldor's Castle is a fast-moving real time graphic adventure for the VIC-20. Can you fight off nine different types of monsters with just your bare hands, or will you need bow and arrow, magic sword, potions and more to steal Baldor's gold? The castle contains more than 70 rooms on three levels. Fast on-screen graphics make this the adventure of a lifetime (if you live!). Program is on cartridge and is more fun with a joystick. Suggested retail price is $29.95. An advanced version for the Commodore 64 is scheduled for release in

Let The SMART 64 Terminal

*COMMODORE 64**

Do The DRIVING

No matter which direction you wish to travel in, experience the advantage of computer communications with The SMART 64 Terminal. Discover the program that puts you on the Right Road to: Public-Access Networks, University Systems, Private Company Computers and Financial Services.

The SMART 64 Terminal designed with Quality-Bred features, Affordable Pricing . . . And Service.

So why not travel the communications highways the SMART way!

Suggested $39.95 Retail

Accessories included:

- ☐ *Selective Storage of Received Data.*
- ☐ *Alarm Timer.*
- ☐ *40 or 80 Col. Operation**.
- ☐ *Auto-Dial.*
- ☐ *User-Defined Function Keys, Screen Colors, Printer and Modem Setting.*
- ☐ *Screen Print.*
- ☐ *Disk Wedge Built-In!*
- ☐ *Formatted Lines.*
- ☐ *Review, Rearrange, Print Files.*
- ☐ *Sends/Receives Programs and Files of ANY SIZE.*
- ☐ *Adjustable transmit/receive tables allow custom requirements. These and other features make The SMART 64 Terminal the best choice for grand touring telecommunications.*

*Commodore 64 registered trademark of Commodore Business Machines Inc.
*Supports 80-column cartridge by Data 20 Corporation. Circle No. 173

Dealer Availability
Call (203) 389-8383

MICROTECHNIC SOLUTIONS
P.O. BOX 2940, New Haven, Ct. 06515

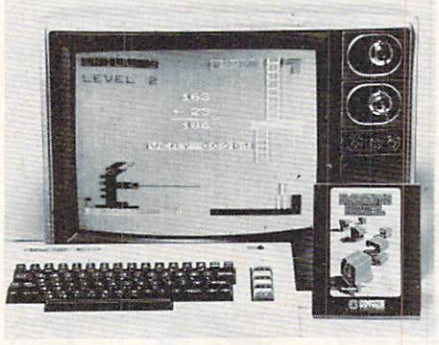
the fall of 1983 and will have more than 250 rooms with 10 levels and the option of designing your own castle. It will be available on disk.

Programs may be ordered directly from Arfon Micro, 111 Rena Drive, Lafayette, LA 70503, (318) 988-2478. Dealer inquiries are welcome. Circle No. 256

COMPUTER SOFTWARE ASSOCIATES INTRODUCES LINE OF EDUCATIONAL PROGRAMS FOR THE VIC-20

"Reading and writing and 'rithmatic
Taught to the tune of a silicon chip. . . "

That old schoolroom ditty will never be the same again now that microcomputers have become as much a part of the classroom as chalk dust. In keeping with this trend, Computer Software Associates (CSA), a Massachusetts-based publisher of home and entertainment programs, is offering its initial line of educational software designed especially for preschoolers and elementary school pupils. Programs include Math Duel, Tiny Tutor, Vic Sketch and Composer, all on cassette tape for the unexpanded VIC-20.

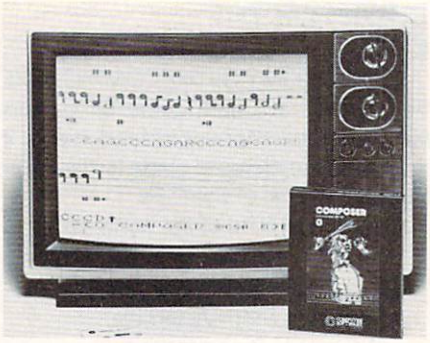


MATH DUEL is designed for grades one through six. The program teaches basic number skills (addition, subtraction, multiplication, division) by pitting the student against a dragon in a den. Three levels of difficulty permit the program to be enjoyed by all ages.

TINY TUTOR is designed for toddlers between the ages of two and seven. The program features mathematical problems delivered via "trollies on a track." Correct answers are rewarded by fun sound effects and the arrival of a new "problem train."

VIC SKETCH, a versatile etch-a-sketch program, enables the user to draw in any one of seven colors. All drawings can be printed, saved or erased. Drawings can be executed with keyboard keys or a joystick.

COMPOSER teachers the rudiments of music, enabling the user to compose simple melodies, using the computer to key in the notes and rests. The melodies can be stored on the Datasette recorder for later playback.



MATH DUEL and TINY TUTOR carry a suggested list price of $19.95; VIC SKETCH and COMPOSER, $14.95.

For additional information contact, Micro Software International, Inc., 44 Oak Street, The Silk Mill, Newton Upper Falls, MA 02164. Telephone (617) 527-7510.

Contact:
Sue A. Robbins
Paul Kaufman Associates
149 Madison Avenue
New York, N.Y. 10016 Circle No. 257
(212) 685-6161

DOWN ON THE FARM

Cyberia, Inc. announces the fourth volume of the Farm Manager series for Commodore 64, dedicated to production and marketing of grain. The three previous volumes include: Volume 1–General Business, Volume 2–Beef Production, and Volume 3–Pork Production. Each volume of the series retails for $49.95. Available from: Cyberia, Inc., Box 784, Ames, IA 50010. Circle No. 258

HARD-HITTING SOFTWARE

Phantom Software presents. . . "The ATTACK of the PHANTOM KARATE DEVILS" for the Commodore 64. This is an action-packed, arcade-style martial arts game—the first animated karate simulation of its kind. The player uses the joystick to control the animated actions of the hero. Ferocious punches, flying kicks, and spectacular jumps are used against the relentless onslaught of marauding ninjas. The hero gains strength by surviving each wave of computer-animated attackers, thereby gaining entry to the Netherworld and new challenges. Fighting sticks, flying daggers, shooting stars, and scrolling scenery make the play more exciting.

The game features an eye-attracting demo mode with a spectaculer animated karate match in a twilight temple garden setting. The suggested retail price is $34.95. Available from Phantom Software, 1116A 8th Street, Suite 155, Manhattan Beach, CA 90266 Circle No. 259

CHARTPAK-64

CHARTPAK-64 is a comprehensive package that gives you professional quality charts in high resolution graphics without any programming.

CHARTPAK-64 lets you enter, edit, save and recall data simply and quickly.

Then using this data CHARTPAK-64 lets you interactively build your chart—whether it be a pie chart, bar chart or line chart. You control the scaling, labeling and positioning of the chart on the screen.

CHARTPAK-64 instantly creates your chart on the screen in any of 8 different chart formats. If you don't care for the initial results, CHARTPAK-64 lets you change the format and build another chart immediately.

Finally, CHARTPAK-64 can record the final results on your Commodore 1515, 1525E, Epson or Gemini printer.

Here are some of the charts possible with CHARTPAK-64:

CHARTPAK-64 only on diskette for $42.95.
Available from your local dealer or directly from:
ABACUS Software Circle No. 260
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510

GRAPHICS DESIGNER 64

GRAPHICS DESIGNER 64 lets you design hires or lores graphics. You can use *GRAPHICS DESIGNER 64* for architectural design, engineering graphics, graphic arts, artistic expression, and more.

The *GRAPHICS DESIGNER 64* EDITOR lets you interactively create your picture. The EDITOR is completely menu driven. No programming is necessary! You can edit a picture from the keyboard or with the joystick or a suitable light pen.

Draw lines, boxes, circles, ovals, triangles and then fill them in. Add text and captions to your pictures. When you are all done, you can save your finished pictures to diskette.

The SLIDE SHOW feature lets you combine your pictures for later display. Use the built-in timer to advance pictures or override the time with the function keys.

You can also obtain hardcopy of your hires screen on your VC-1515, 1525E, Epson or Gemini printer.

GRAPHICS DESIGNER 64 only on diskette, $34.95.

Available from your local dealer or directly from:
ABACUS Software Circle No. 261
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510 Continued on page 135

try your skills at
TRAIN DISPATCHER

REALISTIC SIMULATION OF A COMPUTER CENTRALIZED TRAFFIC CONTROL (CTC) OFFICE. HOW QUICKLY AND EFFICIENTLY CAN YOU MANEUVER TRAINS OVER A 20 STATION, 150 MILE TERRITORY? BUILD YOUR OWN SKILLS FROM "CUB DISPATCHER" TO "TRAIN MASTER".

24 DISPLAYS including Train Sheets, Block Permits, Territory Overview, 20 interlockings.

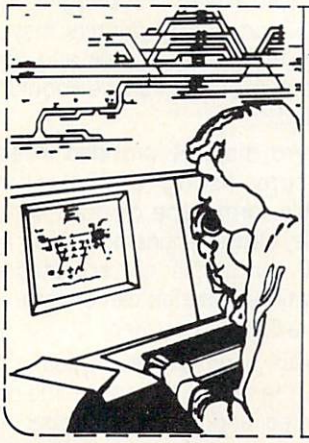
FULL CONTROL Throw switches, clear and cancel signals, route and maneuver up to 12 trains moving in both directions.

REAL TIME All displays continuously updated, including train location, switch positions, signals, block permits, and crew time.

AUTHENTIC Created by designers of CTC Systems for operating railroads.

TRAIN DISPATCHER is an action game, that provides a dramatic and realistic picture of true-to-life railroad operations.

Commodore 64 and VIC 20 are registered Trademarks of Commodore Business Machines, Inc.
ATARI® A Warner Communications Company Apple is registered trademark of Apple Computer, Inc.



SIGNAL COMPUTER CONSULTANTS, LTD.
P.O. Box 18222 Pittsburgh, PA 15236 (412) 655-7727

Enclosed is $24.95 for Train Dispatcher + $2.50 for postage and handling. PA residents add state sales tax.

Charge To: ☐ Master Card ☐ VISA Card# _____ Exp. Date. _____

CHECK ONE

☐ VIC 20™, Tape* ☐ Commodore™ 64 Tape ☐ Commodore™ 64 Disk
☐ Atari® 400/800 Tape** ☐ Apple II®, Disk ($29.95)
☐ Manual is included with game or to be purchased separately at $4.00.

*VIC 20 requires 16K/**Atari 400/800 requires Basic

Signature _____

Name _____

Street _____

City _____ State, Zip _____

Circle No. 232

WHY SPEND MORE?

SUPERBYTE BUSINESS PACK

ON DISK FOR THE

Commodore 64

OR

Vic 20 (8K)

Circle No. 122

INCLUDED ARE...

***THE ACCOUNTANT**
General Ledger, Income Statement & Balance Sht.

***ACCOUNTS RECEIVABLE/ PAYABLE**
Journal for current & paid accounts

***THE EDITOR**
Full feature word processor

***SPREAD SHEET CALC.**
Complete spread sheet/calculating program

***BUSINESS INVENTORY**
Inventory control system

***CHECKBOOK MATE**
Checkbook maintenance & writer

***THE MAILMAN**
Address file with sorting

***PLUS 6 UTILITY PROGRAMS**
Profit Margin/Bus. Calendar & Data Base
Pert Model/Linear Regression/Depreciator
Amortization

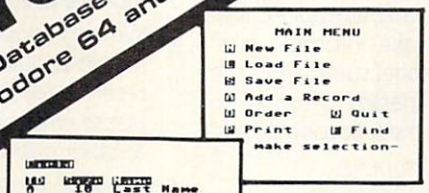
FULL PRINTER CAPABILITIES
COMPLETE REFERENCE MANUAL

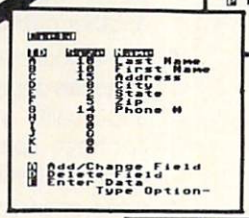
ONLY $100.00
By Check, Charge or COD (& Shipping)

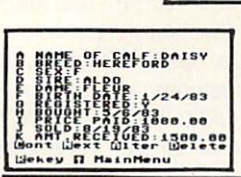
SUPERBYTE SOFTWARE
Master Card BOX 579, 905 LORIEN DRIVE Visa
GWYNEDD VALLEY, PA 19437
(609) 346-3063

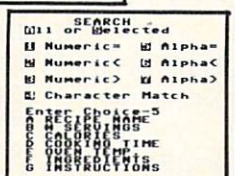
•FREE CATALOG

MicroBase
A Database for the Commodore 64 and VIC 20*









* Requires 8K Memory Expansion

Commodore 64 and VIC 20 are registered trademarks of Commodore Business Machines. Dealer inquiries are welcome.

Here are some reasons why our database is ideal for your home or small business data storage:

- Runs on both the VIC 20* and Commodore 64
- Prints mailing labels, reports, and inventories
- User configurable to adapt to your needs
- Memory resident for speedy operation
- Sorts by any field
- Searches fields with seven different alpha, numeric, and character match parameters
- Prints search-selected mailing lists and reports
- Comes with thorough, easy-to-understand user manual complete with sample applications

Arfon Microelectronics
111 Rena Drive
Lafayette, LA 70503
(318) 988-2489

PLEASE SEND ME:

☐ MicroBase on disk @ $34.95 _____
☐ MicroBase on tape @ $29.95 _____
Shipping & handling $1.50
Louisiana residents add 5% sales tax _____
Total _____

☐ Payment enclosed (check or money order).
☐ Please charge to ___ VISA ___ MasterCard
___ American Express

Acct. # _____ Exp. Date _____
NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

Circle No. 102

REMs to Readers

SUBSCRIPTION INFORMATION

Your subscription to *COMMANDER* is shipped second class mail each month, on or before the fifteenth. If you do not receive your copy of *COMMANDER* by the last day of the month, please send us a card and we will remedy the problem.

Should you change your address, we ask that you notify us immediately. To assure delivery, your change of address must reach us no later than the first of the month prior to month of shipment. Please include your old address, new address, and date of effect. Sorry, without proper notification, we cannot be responsible for replacing any issues.

If you have any questions, please contact our subscription department at (206) 584-6757. All correspondence should be addressed to *COMMANDER* Subscription Department, P.O. Box 98827, Tacoma, Washington 98498.

BACK ISSUE INFORMATION

COMMANDER Magazine's Subscription Department provides the service of back issue order fulfillment. Many issues are still available. All current issues sell for the single copy cover price - which is $2.95. Issues older than one month sell for $3.50, when the supply is plentiful. Include $1.00 (shipping) for each issue ordered.

Most back issues are available in original form. February 1983 is sold out but separate articles are available as reprints. Due to the heavy demand, we suggest you order the back issues you want now while the supplies last.

COMMANDER accepts Visa, Mastercard and American Express. You may also request to be invoiced, but payment is due before shipment.

For further information call or write to our subscription department at P.O. Box 98827, Tacoma, Washington 98498, (206) 584-6757.

READER SERVICE UPDATE

The response to *COMMANDER* Reader Service Cards has been fantastic thanks to your interest in our advertisers' products. The response was so overwhelming, in fact, it became impossible to inform the advertisers of requests immediately. However, a new processing system is in effect and all requests will be answered as soon as possible.

Readers may help keep this flow of information between advertisers and consumers constant by limiting requests to ten advertisements. We also ask that you continue to answer the questions on the card in order for *COMMANDER* to better serve you. If we may answer any questions about *COMMANDER* Reader Services, please contact us at

COMMANDER Magazine
P. O. Box 98827
Tacoma, Washington 98498

ATTENTION COMPUTER CAMPERS

Did you or your children attend one of the many "computer camps" last summer? *COMMANDER* Magazine is planning a spring report on the value and possible problems that may be part of this popular activity. You can help other *COMMANDER* readers make informed decisions by sending us a brief summary of the strengths and weaknesses of your experience, along with the following details:

1. age and sex of camper(s)
2. location and size of camp
3. software and hardware used
4. number of hours per day in computer instruction or labs
5. Sponsoring organization, if any
6. Day camp or overnight

It is not necessary to identify the camp by name unless you wish to. Send all letters to:

COMMANDER Computer Camp Report
Box 98827
Tacoma, Washington 98498

COMMUNICATE through *COMMANDER*

We have a continuing need for publishable material that may be of interest to any segment of Commodore users, ranging from beginners to advanced programmers and technicians. If you've written an original program, or have an idea for a story about some computer application, product, or educational approach, please send us a manuscript or a letter of inquiry. We'd like to hear from younger writers as well as older ones.

Submitted materials should follow these guidelines;

1. Articles must be typed double-spaced, in upper and lower case on 8½" × 11" paper, with at least 1½" margins on all sides. Good quality printers may be used if the output is clear and dark. Two copies of each article should be included.
2. Programs must be provided in both hard-copy listing and machine-readable form (tape or disk). Where feasible, please include both C-64 and VIC-20 versions. If not accepted for publication, materials can be returned only if a SASE is enclosed.
3. On each page should appear your name, the title of the article, the date submitted, and the page number. Any accompanying listings, photos, graphs, etc., must be clearly identified.
4. In your cover letter, include a brief description of your relevant background and interests, the computer equipment you use, and the intended audience of your submission. Don't forget to give your address with both day and evening phone numbers.
5. We only consider articles that are submitted exclusively to us. If you do not receive feedback within 8 weeks, please write or call before sending it to another publication.
6. The amount of payment for accepted materials depends on the type, length, and quality. You'll receive an author contract specifying payment and copyright details before publication.
7. Reviews of commercial products are generally commissioned from our office. Do *not* solicit free copies from manufacturers on your own. However, we would consider well-written, timely reviews of hardware and software you have purchased for your own use.

Send all unsolicited materials to:

Submissions Editor
COMMANDER
P.O. Box 98827
Tacoma, WA 98498

VIC-20® APROSOFT™ SOFTWARE COMMODORE-64®

TYPE FOR YOUR LIFE™

With more challenge than an arcade game, learn to type 75 or more words per minute. Speed is User Selectable, but NO FOOLING AROUND allowed! Text is WIDELY VARIED since it comes from the program tape. Action color graphics with sound fix your eyes on the screen and away from your fingers. Your man rows his boat across the screen as fast as you can type. Maintain speed and he can destroy the sea monster, but if you slow down, ZAP! Runs on unexpanded VIC or C-64.

DR. FLOYD™

Psychoanalysis by computer? Well, not quite, but Dr. Floyd will carry on a conversation with you using psychoanalytical techniques that give the appearance of artificial intelligence. The next time someone asks you "Show me what this computer of yours can do," you can really amaze them with **DR. FLOYD.** Great for parties - even nice for just having someone to talk to. Requires 16k RAM or more. (VIC-20 or C-64).

VIC-20 (Cassette)	**$14.95**
C-64 (Cassette)	**$14.95**
C-64 (Disc)	**$19.95**

Note: VIC-20 versions on Cassette ONLY.
C-64 versions on Cassette OR Disc.

WORDPLAY™

WORDPLAY is a collection of programs which allows the user to make original stories, write a form of Japanese poetry, play the fun game of "Animal" (which children love!) and create jargon. A bonus secret message (cypher) program is also included. In a word, WORDPLAY is a "BARGAIN"! Requires 16k RAM or more. (VIC-20 or C-64).

Software Authors!

We are searching for original programs. We need Educational, Home Entertainment (NO Arcade Games) and other thought-provoking programs. Also well written utility programs. Send for our "Author Submission Package." Include a brief program description. We produce software for all small micros.

Apropos Technology is proud to offer these fine educational and entertaining programs for your computer. Each program comes fully tested. Replacement, if necessary, is guaranteed to original purchaser. Prices shown include shipping charges.

More Software Coming!

VIC-20

40/80 Column Decoder-DISPLAY MANAGER

Just pop this cartridge into your expansion port, and your display instantly goes to the industry-standard 24 lines, with a choice of 40 or 80 characters. Displayed this way, you'll know exactly what you're going to get on the printout. And you really increase the amount of data you can see on the screen!

Sug. List w/Word Manager $129.90

Only **$89.95!**

Display Manager w/8k only **$129.95**
Plus $3.00 shipping & handling

COMMODORE-64

VIDEO PAC 80

Move up to the industry standard 80-column format, and you'll wonder how you ever did without it! Use software control to go from 40 to 80 characters in monochrome—and back to 40 characters in color. With VIDEO PAK 80, you can take full advantage of the terminal emulator mode and screen print feature with software we include. And this is a great package for word processing—particularly with our FREE WORD MANAGER software.

Sug. List w/Word Manager $209.90

Only **$149.95**
Plus $3.00 shipping & handling

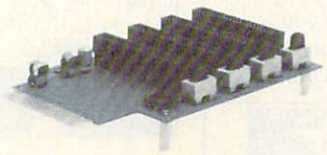
FREE!!!
WORD MANAGER SOFTWARE

This software gives your VIC-20 or Commodore 64 capabilities found only in the most expensive word processing programs. Like full-function status display, and up-and-down scrolling, plus 13 advanced editing features including merging and block move. In addition, we've included complementary mailing list programs. All are written in machine language for fast execution and minimal memory requirements. They're self-documenting and exceptionally easy to use. A self-adhesive strip for function keys makes most commands one-key simple. So simple, in fact, that we've eliminated the need for time-consuming menus and prompts. WORD MANAGER is provided on tape—and can be loaded to disk. It's yours FREE with any VIDEO PAK or any DISPLAY MANAGER.

APROSPAND -64™
for C-64

Gives your Commodore-64 full expandability! Four independently switchable cartridge slots are compatible wity ANY Cartridge for the 64.

New Z-80 VIDEO PAK brings CP/M® compatibility 64. This exciting package gives you all the VIDEO PAK 80 features described above. Equally important, our built-in microprocessor and software give you CP/M compatibility for any programs formatted for the Commodore 1541® Disk Drive. The possibilities are truly awesome! Now also included a complete DATA BASE PROGRAM!



NEW PRODUCT!

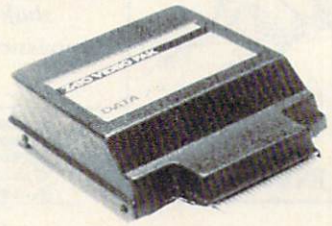
Shown with case removed

Only **$49.95**
Plus $3.00 shipping & handling

PARALLEL PRINTER INTERFACE
for VIC-20 or C-64

So easy to use - simply plug-in and print. Includes all cables & connectors to a Centronics Type Parallel Printer. Includes all Commodore Graphics and requires NO power.

ONLY **$59.95**
Plus $3.00 shipping & handling



Only **$259.95**
Plus $3.00 shipping & handling

Sug. Price $299.95

CP/M is a registered trademark of Digital Research, Inc.

APROPOS TECHNOLOGY
1071-A Avenida Acaso
Camarillo, CA 93010

TO ORDER:

Send Check or Money Order For the Total.
Calif. residents add 6% tax.

Phone orders Call **(805) 482-3604**

VISA All Prices U.S. Dollars MasterCard

CHARGE CARDS ADD 3%

Circle No. 37

APROPOS TECHNOLOGY

DEALER INQUIRIES WELCOME

VIC-20 & Commodore-64 are registered trademarks of Commodore International.

Write For FREE Catalog

VISA

(602) 855-3357

Call your order in and get a FREE program

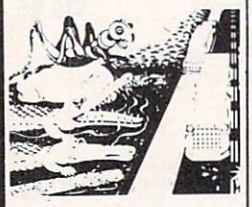
NEW VIC SOFTWARE CBM 64

Call your order in and get a FREE program

Write For FREE Catalog

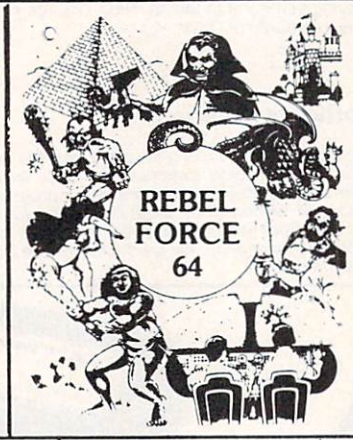
MasterCard

(602) 855-3357



CRICKET

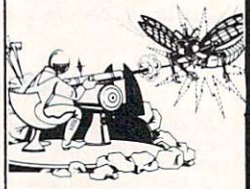
Software from ComputerMat will turn your VIC or 64 into a home arcade.



PROGRAMMERS CONTEST

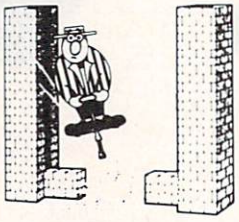
Send Us Your Best VIC or 64 Program

Winners will receive royalties plus $1,000 in prizes.



BUG BLAST

PARATROOPER



POP TOP

MUSIC MAKER 64

TARGET COMMAND

MOW

COSMIC CRUZER

We have more games and programs than you can shake a joystick at!

SHOGUN 64-VIC

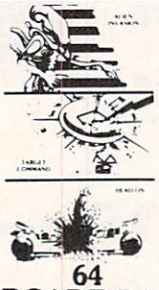
CHRISTMAS SPECIALS

Buy 2 Programs and Get 1 Free!

For every 2 VIC or 64 programs you buy, we will send you a coupon for a third program free!

SPACE PAK

ALIEN INVASION

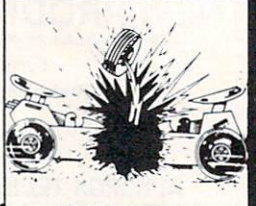


64 ARCADE PAK

STOMPERS - 64

SUPER PAK - 64

SNAKE OUT



HEAD ON

ComputerMat • Box 1664 B • Lake Havasu City, AZ 86403 *Add $1.00 For Shipping*

Circle No. 12

ReCommand

UPDATES, CLARIFICATIONS AND CORRECTIONS TO PREVIOUSLY PUBLISHED MATERIAL

SLOT MACHINE FOR C-64, OCTOBER 1983, p.32

If you've experienced any confusion over how to run this program, here are some step-by step instructions:

1. Type in Listing 2 and save on disk as "SLOT.BOOT"
2. Type in Listing 1 and save on disk as "SLOT-DATA"
3. Type in Listing 3 and save on disk as "SLOT"

The order of steps 1, 2, and 3 is not important, but at this point you should have three separate files stored on one disk. Be sure to proof the listings before going any further.

4. LOAD and RUN "SLOT-DATA"
5. LOAD and RUN "SLOT.BOOT"

If all goes well, you should now be ready to play!

(Some readers may have noticed on p. 117 that DATA lines 2230-2320 were printed twice. It won't hurt to repeat them as you type the program, but it won't help either.)

For those of you who prefer to LOAD and RUN without going through the typing, Mr. Gaukel has sold this program to Superior Graphics Emporium, who commercially distributes it on tape or disk.

SPECIAL CHARACTERS IN PROGRAM LISTINGS

In the October 1983 issue of *COMMANDER,* some of the BASIC program listings include numbers such as ❮192❯ and ❮196❯ to indicate special characters that should be typed between quotation marks. (See pages 57 and 92 for examples.) In case you are wondering what to do at that point in the program, the answer can be found in the CHR$ index listed in the User's Manual of your VIC-20 (pp. 145 - 147) or C-64 (pp. 135 - 137). If the bracketed number is between 192 and 223, subtract 96 before looking in the table. If it is between 224 and 254, subtract 64. The symbol ❮192❯, for example, means press the key which represents the graphics character "-", or [Shift–*] which is the same as CHR$(96).

ENDING, ENDING, WHO'S GOT THE ENDING?

In our November issue, Jerry Byrd's column "The Pro Gram" was really longer than it may have appeared at first glance. At the bottom of page 54, we inadvertently omitted the statement "Continued on Page 102." However, we are pleased to note that those who read *COMMANDER* backwards would have experienced no problem, since the top of page 102 clearly says "Continued from page 54."

RESET THE VIC CLOCK

The article titled "Vic Clock" published September, 1983 has two errors in the program listing on page 97. Lines 9510 and 9930 should be corrected as follows:

```
9510 CHAR 0, 15,"XX.XX":
  AC=AC+1
9930 GRAPHIC0:IFCH$❯"2"THEN
  PRINTAC:"RIGHT":PRINTW;
  'WRONG":FOR JJ=1TO1000:NEXTJJ
```

BASICMON CORRECTION

In our last issue (December/January, Vol. 2, No. 1) the program entitled BASICMON in Eric Giguere's article, "Using a Machine Language Monitor" had one line that was accidentally cut off. On page 132, program line 50 should read:

```
50 MA=0:IFPEEK(806)=202THEN
  MA=1:REM MA=0 FOR VIC,
  MA=1 FOR C64
```

COMMAND POST RX FOR C-64 OCTOBER 1983, p. 62

The following information should help you adapt the Command Post RX program in our October issue to the C-64.

	VIC-20	C-64
Joystick Port	User Port	User Port
R=4 DR=37139 JS=37137	R=1 DR=37138 JS=37136	R=1 DR=56579 JS=56577
Pin 8-ground Pin 1-input	Pin A-ground Pin C-input	

Note: No Joystick connection is shown for the C-64 since this port is handled differently than on the VIC-20

Substitute the values in this chart for those in line 200 of the listing.

```
187 IFG>7680+22*21THENF=0:GOTO050
    0

189 POKEG,81:GOTO125

220 IFA<0THENA=0

221 IFA>15THENA=15

222 PRINTTAB(A)''[sp, 3 times][s
    hf--]''

225 PRINTTAB(A)''[sp, 3 times][s
    hf-W]''

230 PRINTTAB(A)''[9rn][sp, 3 tim
    es][shf-W]''

235 PRINT''[up, 3 times]'';:GOTO
    135

300 PRINTTAB(A)''[sp, 4 times]''

305 PRINTTAB(A)''[sp, 4 times]''

310 PRINTTAB(A)''[sp, 5 times]''

315 PRINT''[up, 3 times]'';:RETU
    RN
400 PRINTPEEK(197):GOTO400

500 POKEG,66:POKEG+1,78:POKEG-1,
    77:POKEG-20,46:POKEG21,46:PO
    KEG-22,46

510 POKEG-23,46:POKEG-24,46

520 FORAA=1TO100:NEXT

530 POKEG,32:POKEG+1,32:POKEG-1,
    32:POKEG-20,32:POKEG-21,32:P
    OKEG-22,32

535 POKEG-23,32:POKEG-24,32

590 GOTO125
600 POKEC,42 :POKEC+1,42 :POKEC+
    22,42 :POKEC-22,42:GOTO605

601 L=0

605 POKEC,42:POKEC-1,42:POKEC -2
    2,42:POKEC+22,42:POKEC-1,42

610 POKEVN,128+100

611 FORGG=15TO0 STEP-1:POKEVA,GG
    :FORGH=1TO70:NEXT:NEXT

615 B=0:D=0

616 POKEC,32:POKEC+1,32:POKEC-1,
    32:POKEC+2,32:POKEC-2,32:POK
    EC+3,32:POKEC-3,32

617 POKEC-22,32:POKEC+22,32

640 E=E+22+J:POKEVA,15:POKEVN,0:

645 POKEE,62:POKEE-1, 87 :POKEE-
    2,60

646 FORO=248TO253:POKEVN-1,O:NEX
    T:FORO=253TO248STEP-1:POKEVN
    -1,O:NEXT

647 POKEE,32:POKEE-1,32:POKEE-2,
    32

650 IFE<7680+20*22THEN640

651 E=E+J

652 POKEE+22,62:POKEE+21,87 :POK
    E+20,60:POKEE+OF,4:POKEE+OF-
    1,4:POKEE+OF-2,4

653 POKEE+22+OF,0:POKEE+21+OF,0:
    POKEE+20+OF,32

654 POKEVN-1,0:POKEVN,128:FORQ=1
    TO20:POKEVA,15-INT(Q/1.33)

655 POKEE,223:POKEE-1,223:POKEE-
    2,223:FORO=1TO80:NEXT

656 POKEE,169:POKEE-1,169:POKEE-
    2,169:FORO=1TO80:NEXT

657 NEXT:POKEE,32:POKEE-1,32:POK
    EE-2,32:POKEE+22,32:POKEE+21
    ,32:POKEE+20,32:

658 PRINT''[home][down, 2 times]


659 DU=DU+2:DU$=STR$(DU):PRINT''
    [home][down, 2 times]SCORE''
    DU$:PRINT''[down, 15 times]''
    :IFDT>5THEN806

660 GOTO125

700 POKEVN,128:L=0

701 A=A+1:FORKL=1TO200:POKEVA,15
    -INT(KL/13):
```

New From

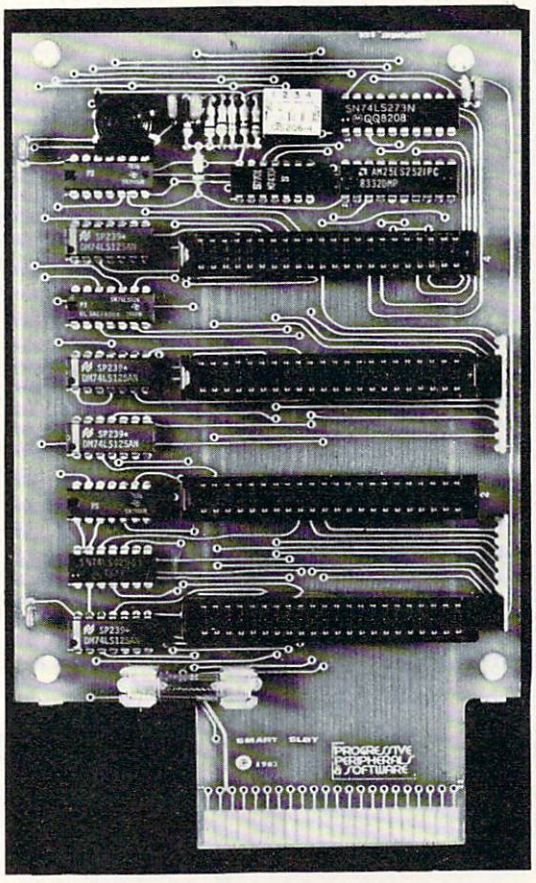
Progressive Peripherals & Software

Why have a dumb card when you could have a

SMART SLOT

Four-slot, software-selectable interface for the C-64

The Smart Slot is the first intelligent buss expansion interface for the Commordore 64™. This quality product allows you to select any cartridge or combination of cartridge slots with one POKE statement. Slots may also be selected with Hardware D.I.P. Switches giving you full manual control.



All SMART SLOTS are fully tested to insure quality and reliability.

Smart Slot features:

- Eleven IC's
- High quality stand off supported circuit boards
- Full size easy to use manual
- A non-switched 5V line
- Active control of six signal lines per slot
- Convenient D.I.P. switches
- Military spec edge card connectors
- Gold-plated contacts
- Fused to protect your computer
- Convenient reset button
- Full guarantee

We accept VISA/MASTERCARD

Circle No. 58

2186 South Holly, Suite 2 • Denver, Colorado 80222
ORDER HOTLINE: (303) 759-5713
DEALER AND DISTRIBUTOR INQUIRIES INVITED

® Commodore 64 is a registered trademark of Commodore Business Machines.

```
704 PRINTTAB(A)''[pur][shf-£, 3
    times]''

705 PRINTTAB(A)''[pur][com-*, 3
    times]''

715 PRINT''[up, 2 times]'';

720 PRINTTAB(A)''[pur][com-*, 3
    times]''

725 PRINTTAB(A)''[pur][shf-£, 3
    times]''

735 PRINT''[up, 2 times]'';

740 NEXT
745 PRINTTAB(A)''[sp, 4 times]''

750 PRINTTAB(A)''[sp, 4 times][9
    rn]''

751 PRINTTAB(A-1)''[sp, 5 times]
    '';

752 PRINT''[up, 3 times]'';

756 PRINT''[home][down, 2 times]
757 DT=DT+1:PRINT''[home][down,
    2 times][right, 12 times]BAS
    ES''DT:PRINT''[down, 15 time
    s]''

758 IFDT>5THEN806

760 F=0:A=0:GOTO105

800 D=1:E=7702+INT(RND(1)*14)*22
    +88 :I=E-20:K=0:J=-1:IFRND(1
    )>.5THENE=E-21:I=E+20:J=1

805 GOTO172

806 IFDU>HSTHENHS=DU
807 PRINT''[clr][down, 4 times][
    sp, 3 times]YOUR[sp]SCORE[sp
    ]='';DU

808 PRINT''[sp, 3 times]HIGH[sp]
    SCORE[sp]='';HS

820 PRINT''[down, 2 times][sp, 2
     times]TRY[sp]AGAIN[sp](Y/N)
    '';
830 POKE198,0:INPUTF$:IFLEFT$(F$
    ,1)=''Y''THEN1

840 END
```


Commodore 64
and
VIC-20

SuperTerm

$149.95

Telecommunications
with a difference!

Unexcelled communications power and compatibility, especially for professionals and serious computer users. Look us over; **SuperTerm** isn't just "another" terminal program. Like our famous Terminal-40, **it's the one others will be judged by.**

- **EMULATION**—Most popular terminal protocols: cursor addressing, clear, home, etc.
- **EDITING**—Full-screen editing of Receive Buffer
- **UP/DOWNLOAD FORMATS**—CBM, Xon-Xoff, ACK-NAK, CompuServe, etc.
- **FLEXIBILITY**—Select baud, duplex, parity, stopbits, etc. Even work off-line, then upload to system!
- **DISPLAY MODES**—40 column; 80/132 with side-scrolling
- **FUNCTION KEYS**—8 standard, 52 user-defined
- **BUFFERS**—Receive, Transmit, Program, and Screen
- **PRINTING**—Continuous printing with Smart ASCII interface and parallel printer; buffered printing otherwise
- **DISK SUPPORT**—Directory, Copy, Rename, Scratch

Options are selected by menus and EXEC file. Software on disk with special cartridge module. **Compatible with CBM and HES Automodems;** select ORIG/ANS mode, manual or autodial.

Write for the full story on SuperTerm; or, if you already want that difference, order today!

Requires: Commodore 64 or VIC-20, disk drive or Datasette, and compatible modem. VIC version requires 16K memory expansion. Please specify VIC or 64 when ordering.

Smart ASCII Plus . . . $59.95

The only interface which supports streaming —sending characters simultaneously to the screen and printer — with SuperTerm.

Also great for use with your own programs or most application programs, i.e., word processors. **Print modes:** CBM Graphics (w/many dot-addr printers), TRANSLATE, DaisyTRANSLATE, CBM/True ASCII, and PIPELINE.

Complete with printer cable and manual. On disk or cassette.

VIC 20 and Commodore 64 are trademarks of Commodore Electronics, Ltd.

Circle No. 25

(816) 333-7200

Send for a free brochure.

MIDWEST MICRO inc.

MAIL ORDER: Add $1.50 shipping and handling ($3.50 for C.O.D.); VISA/Mastercard accepted (card# and exp. date). MO residents add 5.625% sales tax. Foreign orders payable U.S.$, U.S. Bank ONLY; add $5 shp/hndlg.

311 WEST 72nd ST. • KANSAS CITY • MO • 64114

SUPPORT YOUR LOCAL PROGRAMMER

Continued from page 72

If you have done your job well at this point, have confidence that the inquiries will come, probably beginning a week or so after you see your own ad. The response will be hard to judge for sometime to come but you should see one inquiry per day spread out over a month or so. Remember there will be virtually no pattern to how they arrive, six one day, none the next.

You now have some control over how things go from this point. First, answer your mail promptly. Particularly in the beginning the response will probably not be so overwhelming that you cannot answer the requests as they come in rather than waiting to answer them in groups. If you can write a brief but personal note to go along with the information you send out it will help create sales. Know your competition! You should have looked into this before now, but if someone else is offering a similar program, buy a copy, find out what its limitations and strong points are. If yours is better, and it should be or you shouldn't be marketing it, say so. Don't be afraid of comparision. Let the magazines know what you have via product announcements. If someone in particular usually writes new product reviews send them a sample copy of your wares along with a personal note. A positive evaluation is invaluable free advertising!

After several additional weeks the orders should start coming in. If not try and find out why not. You have been keeping a mailing list of all those who answered your ad haven't you? Perhaps your price is a bit stiff, consider discounting. The amount of leeway you have of course depends on what your price was to begin with and what your time is worth to you. Remember also, if your program is priced reasonably most people will not go to the trouble of stealing it, but the higher the price the more you invite pirating.

Everything is going well at this point, what do you do next? First of all make sure you have arranged to have your ad run in the next issue as well. Remember the needed lead time. In some cases you may have to initially place two ads at once in order to make the deadlines for both issues. Consider the same ad in another publication-your second choice based on readership. Usually the rates there will be a bit cheaper. Most importantly, start thinking about your next product. Your customers will want to know what else you have available. If you carry a variety of programs you increase the chance of having something your customer wants, besides inviting repeat sales to the same customer. The process for your next project should be identical, the same amount of development and testing time, the same thoughtful attention to the documentation.

ONE MAN'S CALLING

But you are not a programmer, you say. You do not LIKE trying to keep GOSUBS straight from FOR/NEXT loops. Are you an electronics experimenter? Have you ever designed a printed circuit board or built simple projects? There is a definite lack of availability of simple interfacing hardware for the small home computers. Control of all kinds of things is possible and even simple with an interface between your computer and the outside world. Collaborate with someone to write your program, and you design the hardware.

THE GREAT AMERICAN PROGRAM

Your program is a success but you have saturated the market. Your program wasn't so successful but is still a good program that you would like to share with others and recover some of your time and money. You don't like building things. There is yet another avenue open to help finance your hobby. Write up your program and submit it for publication! Again, you won't get rich, but you will get a certain notoriety and will at least defer some of your costs.

I know, you told me before you don't like programming. Sometimes an "idea" article without a specific program can be saleable. Think of things that are related. An article I wrote on duplicating data cassettes was based on years of experience in the audio visual field, not on years of experience with home computers. Perhaps you are a telephone person, knowledgeable about connecting to the phone lines. You could write an article about modems, or about transmission errors encountered on landlines. Let's say you are a heating and cooling specialist. You could explain heat loss and discuss how the formulas you use could be used in an energy audit program.

Well, you've collected some bucks and are ready to make additions to your system. The nice thing about this cycle is that as your system grows you can develop software and hardware and articles that use these new pieces of equipment. Your customers are probably growing along with you making them likely candidates for your new products.

Additionally you may find that the type of program you are offering is not available for several small home computers. Consider reinvesting some of your profit in a different small computer and adapting your program to that system. The Commodore VIC-20 and C-64 offer a unique opportunity in that although the software is not directly interchangeable, the peripherals are. So you can take your profits to upgrade to a 64 and offer software for both. Again you might consider collaborating with someone who owns a different machine in order to accomplish this same goal.

UNCLE SAM WANTS YOU (TO MAKE A PROFIT)

This is the clincher, folks. If you do it right, all of your development costs and new hardware can be deducted as business expenses for your small business. It is beyond the scope of this article to discuss the particulars of business deductions, but they are the same for this type of sideline as for any other. Basically as long as you keep receipts and are honestly trying to make money you should be OK. Under certain circumstances you may even be able to deduct the cost of the room where you do your computing. But don't try to deduct a new Atari game machine for the kids!

For anyone willing to use a little creativity your computer hobby can pay for itself. Of great additional value is the knowledge that you gain for yourself. I look forward to seeing your ad!

'PUBLIC DOMAIN'™ — SOFTWARE —

Supporting all COMMODORE computers
Written by users, for users
★ GAMES ★ UTILITIES ★ EDUCATIONAL ★

VIC 20™
collection #1 – collection #2 – collection #3
collection #4 – collection #5 – collection #6
70+ programs per collection – Tape/Disk – $10.00

COMMODORE 64™
64 collection #1 – 64 collection #2 – 64 collection #3
64 collection #4 – 64 collection #5
25+ programs per collection – Tape/Disk – $10.00

PET® / CBM®
5 Utility – Tapes/Disks – $10.00 each
11 Game – Tapes/Disks – $10.00 each
6 Educational – Tapes/Disks – $10.00 each

DINSET™: Reset Switch
Works on Vic 20 or Commodore 64 – $5.00

All prices include shipping and handling.
CHECK, MONEY ORDERS,
VISA and MASTERCARD accepted.

For A Free Catalog Write:
Public Domain, Inc.
5025 S. Rangeline Rd., W. Milton, OH 45383
10:00 a.m. - 5:00 p.m. EST – Mon. thru Fri.
(513) 698-5638 or (513) 339-1725

Circle No. 47

VIC 20™, CBM™ and Commodore 64™ are Trademarks of Commodore Electronics Ltd
PET® is a Registered Trademark of Commodore Business Machines, Inc.

Key-Mander

HOW TO TYPE IN BASIC PROGRAMS FROM *COMMANDER* MAGAZINE

As you probably know, your computer has a limited vocabulary and responds to BASIC language instructions in an extremely literal way. Programs listed in *COMMANDER* are carefully pretested, and should run as intended on your computer if they are copied properly. The following guidelines should help to clarify some important points about entering programs through the keyboard.

WRAP AROUND

Every "line" in a BASIC program begins with a line number and ends when you press the [RETURN] key. If a line in the program contains more characters and spaces than can fit on the width of your screen, just keep typing and the computer will automatically continue on the next row of the screen. You should press [RETURN] *only once* before starting the next line number. A 40-column C-64 or PET will "wrap-around" a program line for no more than 2 screen rows, with a maximum of 80 characters per program line. The 22 column VIC-20 can wrap around up to 4 rows (88 characters) in a program line.

SPACES

In a BASIC statement, spaces are usually ignored by the computer but may be added by programmers to increase readability. However, when the "quote mode" is in effect (see below), spaces do count. Unless you have good reason to do otherwise, it is probably safest to type spaces as they appear in our listing. Please note, however, that wrap-around lines will *not* be indented on your screen the way they appear in our published listing.

PUNCTUATION

Pay careful attention to punctuation symbols. You may not think there's much difference between a colon and a semicolon, but the computer certainly does. All commas, parentheses, and other special characters should be faithfully copied.

PLEASE NOTE: For technical reasons, quotation marks are listed as a double apostrophe. When you see that, press [Shift-2] for the quotation mark symbol.

ONES AND ZEROS

Among the most common errors of beginners (and even experts) is confusing the numbers 1 and Ø with the letters I, L, and O. You may have learned to type a lower case L for 1 on a typewriter, but most computers will not allow it. In our listings, pay close attention to the shape differences between the numbers 1 and Ø and the similar letters, I and O.

SAVE IT WHEN YOU CAN

It is wise to SAVE a program on tape or disk before running it. That way, if the computer "locks up" or becomes inoperative because of an error, you won't have to re-type everything. For a very long program, it is advisable to save what you have entered after every 20 or 30 minutes of typing.

THE "QUOTE MODE"

Most Commodore computers incorporate an extremely useful, though tricky, feature called the Quote Mode. This allows you to program screen control functions, including cursor movement and character color changes, within a PRINT statement. Quote Mode is turned on whenever the quotation mark key [shift-2] is pressed. It is turned off when the quotation mark key is pressed again, or when the [RETURN] key is pressed.

When the quote mode is *on*, any time you press either a cursor control key, a color control key (such as [ctrl-wht]), or a reverse control key, you will see an inversed graphic character appear on your screen. These characters have no obvious meaning by themselves except as indicators that certain control functions have been inserted in the program. These inverse graphic characters also appear in normal, hard-copy (paper) listings of a program, but are nearly impossible to interpret in that form.

THE *COMMANDER* "QUOTE MODE" LISTING FORMAT

To make your task as easy as possible, *COMMANDER* has adopted a unique format for all control and graphic characters, as well as spaces, that occur between quotation marks. In our listing, each special character is represented by an abbreviation that appears between a pair of square brackets. For example, [down] means to press the cursor-down key once. The abbreviation [com-G] means to hold down the Commodore logo key (at the far lower right of the keyboard) while pressing G. When you see [shf-W], hold the shift key and press W. The space bar is indicated by the symbol [sp]. When the same special key is to be pressed more than once, the number of repeats will be shown between the brackets, for example, [right, 8 times].

Here is a list of the most common special key abbreviations:

Abbreviation	Key(s) to Press
[blk]	CTRL & 1
[wht]	CTRL & 2
[red]	CTRL & 3
[cyn]	CTRL & 4
[pur]	CTRL & 5
[grn]	CTRL & 6
[blu]	CTRL & 7
[yel]	CTRL & 8
[rvs-on]	CTRL & 9
[rvs-off]	CTRL & Ø
[clr]	SHIFT & CLR/Home
[home]	CLR/HOME
[inst]	SHIFT & INST/DEL
[down]	CRSR ↓
[up]	SHIFT & CRSR ↓
[right]	CRSR →
[left]	SHIFT & CRSR →
[Shf-x]	SHIFT & X(or any key indicated)
[com-X]	Commodore (lower right key) & X (or any key indicated)

WOW!

DON'T MISS OUT ON OUR GREAT HARDWARE AND SOFTWARE DEALS FOR THE VIC-20/C64.

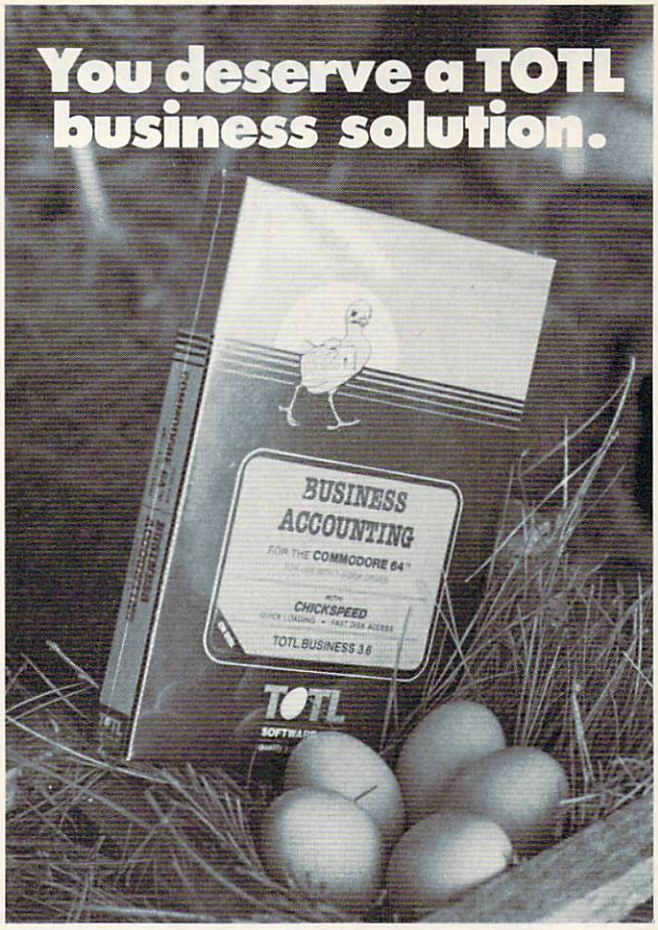
Send in your name and address to receive our FREE catalogs on fantastic hardware and software for your VIC-20/C64. We are dedicated to bringing you the best quality and/or least expensive items for your computer. Take advantage of our special introductory offers.

Mark off the reader service card (if this magazine has one) or send in your letter TODAY.

OMNITRONIX

PO BOX 12309 DEPT.GC2
SEATTLE, WA 98111 Circle No. 64

You deserve a TOTL business solution.



WORD PROCESSING
TOTL.TEXT

MAILING LIST AND LABELS
TOTL.LABEL

TIME MANAGEMENT
TOTL TIME MANAGER

KEYWORD CROSS REFERENCE
RESEARCH ASSISTANT

For Commodore 64™ and VIC 20™

Announcing the newest members of the family...

BUSINESS ACCOUNTING FOR **$95** (SUG. RETAIL)
TOTL.BUSINESS

SPELLING CHECKER FOR **$35** (SUG. RETAIL)
TOTL.SPELLER (64 only)

DATABASE MANAGEMENT FOR **$50** (SUG. RETAIL)
TOTL.INFOBASE

TOTL SOFTWARE, INC.
quality you can afford

Circle No. 46

Ask your dealer about TOTL Software or send in the coupon for further details and ordering information.

1555 Third Avenue, Walnut Creek, CA 94596
PLEASE SEND ME MORE INFORMATION ON TOTL SOFTWARE

Name: _____

Address: _____

_____ Zip _____

A Star is Born.

TelStar 64™
by Eastern House

A Communications Cartridge for the Commodore 64.

Upload/Download, Status Line, etc. Works with your Commodore 1600 or 1650 Modem. Auto-dialing, etc. when used with the new CBM 1650 Modem.

Cartridge and Manual – $49.95

Circle No. 14

Eastern House
3239 Linda Dr.
Winston-Salem, N.C. 27106
(919) 924-2889 (919) 748-8446

COMMAND-BOARD

Show us how you command your favorite computer game. We want you to put your best effort on record in the COMMAND-BOARD. To show the Commodore world your best score send your entries to: COMMAND-BOARD, P.O. Box 98827, Tacoma, WA 98498

Annihilator *from Victory Software*
★ 150,000 James Thompson, New York, NY

Adventureland *from Commodore*
★ 99 Joshua Elman, Tacoma, WA

Astroblitz *from Creative Software*
★ 66,510 Ponder Paul, Bacliff, TX

Chomperman *from Victory Software*
★ 50,368 Steve Carter, Milwaukee, WI

Exterminator *from Nufekop*
★ 2,357 Jack Zampa, Kansas City, KS

Final Orbit *from Sirius*
★ 98,237 Jessica Fine, Little Rock, AR

Frogger *from SEGA*
★ 49,750 Gagan Sarine, Longueuil, Quebec, Canada

Gothmog's Lair *from Galactic Software*
★ 58 Elliot Ferguson, Louisville, KY

Jupiter Lander *from Commodore*
★ 10,964 Joshua Elman, Tacoma, WA

Keyquest *from Microware Distributing*
★ 74,798 Darrell Eastman, Tacoma, WA
★ 24,962 Nick Blenkush, Santa Monica, CA
★ 13,510 George Bergman, Atlantic City, NJ

Kongo Kong *from Victory Software*
★ 28,960 Bobby Apple, Toronto, Ontario, Canada

Omega Race *from Commodore*
★ 628,850 Richard Seemayer, Fresh Meadows, NY

Pyramid *from Aardvark Action Software*
★ 792 Jason Benstalk, Carbondale, IL

Radar Rat Race *from Commodore*
★ 78,880 Richard Seemayer, Fresh Meadows, NY

Save New York *from Creative Software*
★ 98,432 Dennis Jackson, Pittsburgh, PA

Serpentine *from Creative Software*
★ 86,438 Natalie Evans, Columbus, OH

Sidewinder *from Tronix*
★ 792,726 Tony Freeman, Houston,TX

Snakman *from Microdigital*
★ 3,123,840 Michael Wampold, Seattle, WA

Space Sentinel *from T & F Software*
★ 250,685 Jake Larsen, Muncie, IN

Spider City *from Sirius*
★ 6,859 Joy Wilson, Fresno, CA

Trashman *from Creative Software*
★ 200,725 Mike Bullard, Germantown, TN

Tyler's Dungeons *from Creative Equipment*
★ 100 Fred Firkto, El Paso, TX

Warp *from The Code Works (Vixel #3)*
★ 13,968 Adam Elman, Tacoma, WA

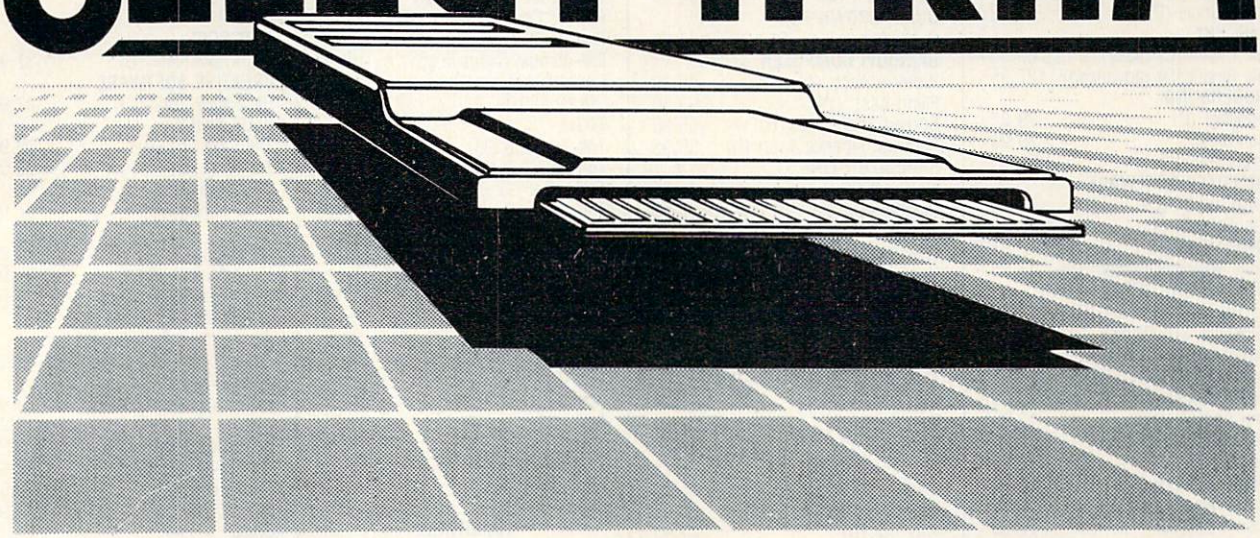
Zap *from Microware Distributors*
★ 25,000 Richard Campbell, Wichita, KS

Zarcon *from D.E.S. Soft*
★ 64,851 Brian Hexter. Ames, IA

Professional Tour Golf *from Strategic Simulations*
★ 78 Rob Hopewell, Duluth, MN

All entries must be received by the first of the month to be eligible for the following month.

64K for VIC 20
SELECT·A·RAM



SELECT·A·RAM BRINGS TO YOUR VIC 20 THE POWER THAT ONLY MEMORY CAN PROVIDE.

The power of any computer is measured by its memory capacity. The more memory you have, the more powerful your programs can become.

SELECT·A·RAM gives your VIC 20 the power of memory. 65,536 bytes of power to be exact. Enough programming power to rival any Home computer.

The power hungry programmer can also add more memory. Each of SELECT·A·RAM's two expansion slots will accept any amount of memory from 3K to 128K.

SELECT·A·RAM's powerful expansion capabilities are made possible by a technique we call Soft Select. Soft Select allows your VIC 20 to perform many sophisticated functions not possible with other memory expansion devices, ie., disk drive emulation, printer spooling, simultaneous and interactive program execution (to name just a few of our soon to be released packages).

Bring the power of memory to your VIC 20 . . . . . with SELECT·A·RAM.

Call or write for additional information and the dealer nearest you. Direct orders accepted.

DEALERS INQUIRIES INVITED

Vic 20 is a Trade Mark of Commodore Electronics Limited.

SELECT·A·RAM

- 64K Memory
- Two Expansion Slots
- Write Protection
- Reset Switch
- Expandable with 64K and 128K Modules
- Soft Select Control
- Compatible with All Program Cartridges and Hardware Devices
- Provision for Optional External Power
- One Year Limited Warranty

Distributed in Canada by:

PAX SOFTWARE

60 Hanson Road, Unit 133 Mississauga, Ontario L5B 2P6
(416) 270-2639

ADVANCED·PROCESSOR·SYSTEMS

P.O. Box 43006, Austin, TX., 78745-0001, (512) 282-8222

Circle No. 89

all this...

TITLE	COST
COMMODORE 64	
ACCESS SOFTWARE	
Neutral Zone (T)	$ 27.95
Neutral Zone (D)	27.95
Sprite Master (T)	27.95
Sprite Master (D)	27.95
BATTERIES INCLUDED	
Paper Clip (D)	85.00
Delphi Oricle (D)	99.00
BLUE SKY	
Calc Result (C) (easy)	67.95
Calc Result (D) (advanced)	127.95
BRODERBUND	
Choplifter (C)	29.95
Sea Fox (C)	29.95
Serpentine (C)	29.95
COMPUTER SOFTWARE	
PractiCalc 64 (D)	43.95
PractiCalc 64 (T)	39.95
COMPU THINGS	
Dome Business System (D)	44.95
CONTINENTAL SOFTWARE	
The Home Accountant (D)	56.95
CREATIVE SOFTWARE	
Household Finance (D)	29.95
Household Finance (T)	25.95
Loan Analyzer (D)	16.95
Loan Analyzer (T)	12.95
Car Cost (D)	16.95
Car Cost (T)	12.95
Home Inventory (D)	16.95
Home Inventory (T)	12.95
Moon Dust (C)	29.95
Trashman (C)	29.95
Astroblitz (C)	29.95
DATASOFT	
Moon Shuttle (D)	23.95
EASTERN COMPUTER	
Pro Sports Stats (D)	71.95
EPYX	
Temple of Apshai (D)	29.95
Upper Reaches of Apshai (D)	14.95
Curse of Ra (D)	14.95
Jumpman (D)	29.95
Jumpman (T)	29.95
Sword of Fargoal (D)	23.95
Sword of Fargoal (T)	23.95
Crush, Crumble, Chomp (T)	23.95
Crush, Crumble, Chomp (D)	23.95
Jumpman Jr. (C)	29.95
HES	
Gridrunner (C)	29.95
HES Writer (C)	37.95
HES Mon (C)	29.95
HES Forth (C)	47.95
Turtle Graphics II (C)	44.95
Rescue Squad (D)	23.95
Pipes (C)	29.95
Retro Ball (C)	29.95
Coco (D)	37.95
Benji's Space Rescue (D)	29.95
Attack of the Mutant Camels (C)	27.95
Omni-Calc (D)	37.95
Super Text (D)	79.95
INFOCOM	
Infidel (D)	39.95
Enchanter (D)	39.95
Witness (D)	39.95
Planetfall (D)	39.95
KOALA	
Koala Pad w/Micro Illus. Comm. 64	79.95
LIGHTNING SOFTWARE	
Master Type (D)	31.95
ACCESS SOFTWARE NEW!!!	
Beach Head (D)	27.95
Castle Wolfenstein (D)	23.95
Gruds in Space (D)	29.95
MICRO SOFTWARE INTERNATIONAL INC.	
Zeppelin Rescue (D)	19.95

TITLE	COST
Zeppelin Rescue (T)	15.95
NUFEKOP	
3-D 64 Man (T)	14.95
PROFESSIONAL SOFTWARE	
Word Pro 3 Plus (D)	71.95
Word Pro 3 Plus Spell Right (D)	79.95
Spell Right (D)	39.95
QUICK BROWN FOX	
Quick Brown Fox (C)	55.95
RAINBOW COMPUTER	
Writer's Asst. (D)	55.00
Filing Asst. (D)	63.00
Spread Sheet Asst. (D)	55.00
Personal Finance Asst. (D)	39.95
SIERRA/ON LINE	
Mr. Cool (C)	27.95
Frogger (D)	27.95
Frogger (T)	27.95
New Jawbreaker (D)	23.95
New Jawbreaker (C)	27.95
Crossfire (D)	23.95
Apple Spider Cider (D)	23.95
SIMS	
Color Craft (T)	22.95
Color Craft (D)	26.95
SIRIUS	
Fast Eddie (D)	26.25
Turmoil (D)	26.25
Squish'Um (D)	26.25
Snake Byte (D)	26.25
Type Attack (D)	29.95
Way Out (D)	29.95
Critical Mass (D)	29.95
Blade of Blackpoole (D)	29.95
Repton (D)	29.95
Bandits (D)	27.95
SOFT PLUS	
Meteor Madness (T)	18.95
Meteor Madness (D)	21.95
SPINNAKER	
Kinder Comp (D)	25.95
Facemaker (D)	29.95
Hey Diddle Diddle (D)	25.95
Alphabet Zoo (C)	27.95
Kids on Keys (C)	27.95
Up For Grabs (C)	31.95
Cosmic Life (C)	27.95
Story Machine (C)	31.95
Delta Drawing (C)	31.95
STRATEGIC SIMULATIONS INC.	
Computer Baseball (D)	29.95
SUBLOGIC	
Night Mission Pinball (D)	29.95
Night Mission Pinball (C)	23.95
SYNAPSE	
Fort Apocalypse (D)	26.95
Fort Apocalypse (T)	26.25
Survivor (D)	26.95
Survivor (T)	26.95
Protector II (T)	27.95
Protector II (D)	27.95
Shamus (D)	27.95
TAYLORMADE	
Touch Typing Tutor (T)	14.95
Touch Typing Tutor (D)	18.95
TECH 2 SOFTWARE	
Snakman (D)	23.95
Snakman (T)	19.95
TIMEWORKS	
Robbers of the Lost Tomb (T)	18.95
Robbers of the Lost Tomb (D)	18.95
Wall Street (T)	18.95
Wall Street (D)	18.95
Money Manager (T)	18.95
Money Manager (D)	18.95
Data Manager (T)	18.95
Data Manager (D)	18.95
Inventory Management (D)	63.95

TITLE	COST
Sales Analysis Management (D)	63.95
A/R Management & Invoicing (D)	63.95
A/P Management & Checkwriting (D)	63.95
General Ledger (D)	63.95
Programer Kit No. 1 (D)	19.95
Electric Check Book (D)	19.95
Presidential Campain (D)	19.95
Presidential Campain (C)	19.95
Dungeons of the Algebra Dragons (D)	19.95
TOTL	
Totl Text 2.6 (T)	34.95
Totl Text 2.6 (D)	38.95
Totl Label (T)	18.95
Totl Label (D)	21.95
Time Manager (T)	29.95
Time Manager (D)	33.95
Research Assistant (T)	29.95
Research Assistant (D)	33.95
Totl Business (D)	79.95
TRONIX	
Juice (D)	27.95
VICTORY	
Adventure Pack 1 (T)	14.95
Adventure Pack 2 (T)	14.95
Grave Robbers (T)	14.95
Trek (T)	12.95
Annihilator (T)	16.95
Kongo Kong (T)	18.95
HARDWARE	
CARDCO	
Z-80 Pack CP/M Card	239.00
Cardprint/a	67.95
Cardette/1	33.95
Cardwriter/1	33.95
Cardboard 5 slot	56.95
80 Column Board	143.00

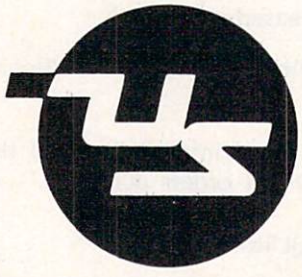
TITLE	COST
TG	
TG Joy Stick	23.95
KRAFT	
Kraft Joy Stick	15.95
HES	
HES Modem	63.95
CARDCO (NEW!!!)	
Printer Utility Pkg.	15.95
Key Pad	31.95
Disk Banks (holds 10 disketts)	5.95
BOOKS	
Elementary 64	11.25
Computer Playground	7.95
Kids and the Commodore 64	15.95
NEW!!!	
SUBLOGIC	
Flight Simulator (D)	37.95
CREATIVE SOFTWARE	
Save New York (C)	27.95
BLUE SKIES	
The Last One (D)	79.95
Script 64 (D)	63.00
BRODERBUND	
Lode Runner (D)	27.95
HES	
Multiplan (D)	79.95
Maze Master (C)	29.95
Synthesound 64 (D)	27.95
SCREENPLAY	
Ken Uston's Professional Blackjack	55.95
SOFTSYNC	
Dancing Feats (D)	23.95
Dancing Feats (T)	19.95
Kentucky Derby (T)	15.95
Kentucky Derby (D)	19.95
Bridge (C)	19.95
Space Action (C)	19.95
SIMS	
Forms Generator (D)	27.95
Forms Generator (T)	23.95
Quiz Me (D)	19.95
Quiz Me (T)	15.95

D = Disk, T = Tape (or cassette) C = Cartridge
B.O. = Back Ordered (Delayed delivery)

and more!

We also carry a large selection of APPLE, ATARI, IBM, & VIC-20 software. We would be pleased to send you our inventory for them.

TO ORDER: Send certified checks, money orders, or use your Master or Visa Cards and call 1-800-343-8019 From inside New Hampshire call 603-542-6175. **Personal or company checks require two to three weeks to clear.** All prices are subject to change without notice. SHIPPING CHARGES.. U.S. orders please add $2.00 (for 1-100 pcs.) For C.O.D. add additional $1.70. 2 Day Air (UPS) add $4.00. **CANADIAN ORDERS:** $5.00 surface mail, or 15% of total sale for Air Mail. ALL OTHER COUNTRIES: 15% of total sale, Air Mail only. Also all orders over $100.00 **must** be insured at .35¢ per $100.00. Customer must pay all duty taxes.
Hours: Monday thru Saturday 8:00 to 10:00 Eastern Time.



UNIVERSAL SOFTWARE
The Best Software for Less
P. O. Box 955
Claremont, N.H. 03743

VISA MasterCard

Circle No. 123

CALL NOW • 1-800-343-8019 • TOLL FREE

VIC-20 USERS!

Win your share of over $5000 in VIC-20 Hardware & Software in

THE NATIONAL VIC-20 USERS GROUP

★ ★ ★ 1984 VIC-20 SWEEPSTAKES ★ ★ ★

cardco, inc.
Amateur Accessories
pace
MICRODIGITAL
NIBBLES & BITS, INC.
CHEATSHEET PRODUCTS
COMM·DATA COMPUTER HOUSE
Public Domain, Inc.
COM·CAP

- Open to ALL VIC-20 Users
- No Purchase Necessary
- No Entry Fee

WIN:

- Arcade Games
- Educational Programs
- Business Programs
- Stock Market Programs
- Sports Programs
- Children's Programs
- FREE NVUG Memberships
- Typing Tutor Programs
- Special VIC-20 Aids
- Memory Expansion
- Motherboards
- Word Processors

AND MORE!

TOTL SOFTWARE, INC.
UNIVERSAL SYSTEMS
ACADEMY SOFTWARE
TAYLORMADE SOFTWARE
BASIC BYTE, INC.
APROPOS TECHNOLOGY
Boston Educational Computing inc.
Sirius

The National VIC-20 Users Group and the Nation's Leading VIC-20 Dealers bring you the best thing to happen since you got your VIC!

WRITE TODAY FOR YOUR FREE OFFICIAL ENTRY BLANK, PRIZE LIST, AND COMPLETE RULES!

THE NATIONAL VIC-20 USERS GROUP
BOX 34575 DEPT. M OMAHA, NE 68134

(VIC-20 Reg. TM of Commodore)

Circle No. 229

C64-FORTH
for the Commodore 64

FORTH SOFTWARE FOR THE COMMODORE 64

C64-FORTH (TM) for the Commodore 64 - $99.95

- Fig Forth-79 implementation with extensions
- Full feature screen editor and macro assembler
- Trace feature for easy debugging
- 320 x 200, 2 color bit mapped graphics
- 16 color sprite and character graphics
- Compatible with VIC peripherals including disks, data set, modeum, printer and cartridges
- Extensive 144 page manual with examples and application screens
- "SAVE TURNKEY" normally allows application program distribution without licensing or royalties

C64-XTEND (TM) FORTH Extension for C64-FORTH - $59.95
(Requires original C64-FORTH copy)

- Fully compatible floating point package including arithmetic, relational, logical and transcendental functions
- String extensions including LEFT$, RIGHT$, and MID$
- BCD functions for 10 digit numbers including multiply, divide, and percentage. BCD numbers may be used for DOLLAR.CENTS calculations without the round-off error inherent in BASIC real numbers.
- Special words are provided for inputting and outputting DOLLAR.CENTS values
- Detailed manual with examples and applications screens

(Commodore 64 is a trade mark of Commodore)

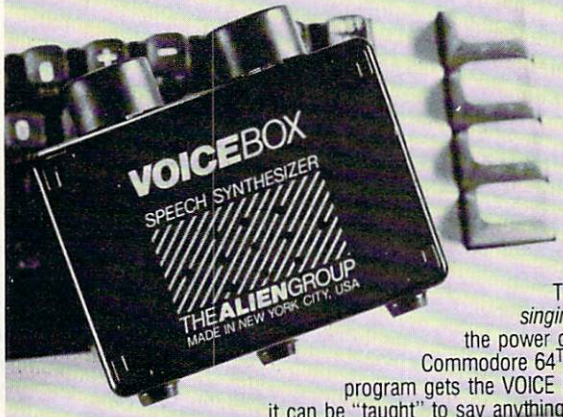
TO ORDER - Specify disk or cassette version
- Check, money order, bank card, COD's add $1.50
- Add $4.00 postage and handling in USA and Canada
- Mass. orders add 5% sales tax
- Foreign orders add 20% shipping and handling
- Dealer inquiries welcome

PERFORMANCE MICRO PRODUCTS
770 Dedham Street. S-2
Canton, MA 02021
(617) 828-1209

Circle No. 32

---

and The Alien said..."Let Commodore Speak... and Sing!"



Yes, the VOICE BOX™ from The **Alien** Group, the world's ONLY *singing* speech synthesizer, now grants the power of speech to the VIC 20™ and the Commodore 64™. A commented, all-BASIC demo program gets the VOICE BOX talking right away, and, since it can be "taught" to say anything, the VOICE BOX has an unlimited vocabulary! The voice speaks with natural speech inflection controlled either from the program or from the precise, built-in Pitch control. *No other speech synthesizer has this feature!*

Want to add speech to a new or existing BASIC program! The VOICE BOX has FOUR ways to do it on VIC 20's of any memory size and on any Commodore 64: entirely from BASIC, or using one of the three machine language programs readily added to other programs — English text-to-speech, the same with the lip-synch "Alien" face added, or use of the 64 basic phonemes as input. A challenging spelling quiz that accepts new words (expanded memory required with VIC 20) is provided on the cassette supplied.

The VOICE BOX plugs directly into the computers user port, comes with built-in speaker, Volume and Pitch controls and lots of instructions from The **Alien** Group, the people who got Atari® and Apple® to speak!

Available at leading computer stores everywhere, or order direct by sending $129.00 to: The **Alien** Group, 27 W. 23rd St., NY, NY 10010. Specify whether for VIC 20, Commodore 64 cassette or Commodore 64 disk. Programs for a high-res talking human face and a comprehensive music and singing system available on separate cassette for $25.00 (expanded RAM necessary when used on VIC 20). Extra main cassette for either computer available for $19.00.

Vic 20 and Commodore 64 are trademarks of Commodore Electronics Ltd. VOICE BOX is a trademark of The **Alien** Group.

Circle No. 101

GOOD PRICES

HUGE SELECTION

Software & Accessories
Upgrades & Repairs

COMMODORE 64

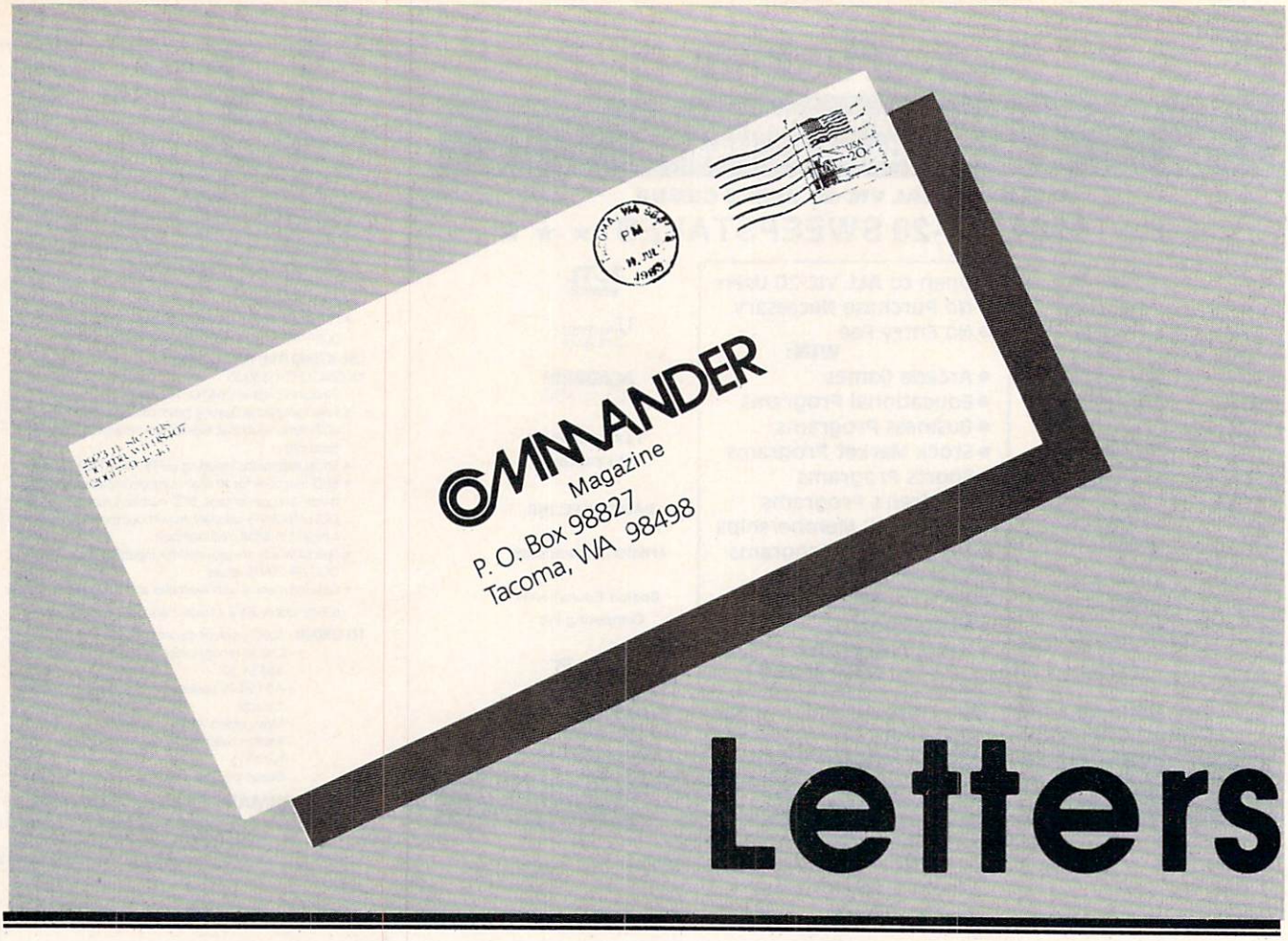
send or call for

FREE CATALOG

Dept. C

PROFESSIONAL MICRO SERVICES
100 W. 22nd St.
Baltimore, MD 21218
(301) 366-0010

Circle No. 215



Letters

To the Editor:

I read with interest your editorial entitled "The Education Boom–Or Bust" (Sept. 1983). As an educator in a small (130 students) parochial school I can certainly relate to the problem of the shortage of educational computer programs that are both inexpensive and well-written. We also have teachers that are somewhat apprehensive to the idea of having that strange looking object sitting in their room. We are, however, looking to the future and see a strong need for computer literacy among our students.

We are currently retreating from the use of computer programs to tutor our children, with the exception of Mathematics, simply because of the high cost of software in the other fields of academics. We are instead turning to instructing our children to become computer literate.

In grades two through six we are instructing our children to program in the PILOT language. We realize that it is a language made especially for teachers, but for instructing children of that age to program, we feel it is second to none. The kids love graphics! We are currently using the VANILLA PILOT made by Tamarack Software and have written our own self-teaching manual so the children are programming without the aid of a teacher most of the time.

In grades six through eight we instruct our children in the BASIC language. Our kids also use adventure games extensively in that grade level.

We will be introducing the LOGO language just recently released by Commodore within the next two months in our first and second grades. We will also be writing our own manual for that.

My point is that you do not have to be a well-funded organization to have what will look like a well-funded computer literacy program.

A little looking to the future will show you that tutorial-type programs are not necessarily the way to go. Teachers have been tutoring successfully for hundreds of years and kids should not be taught to turn to computers for the answers the rest of their lives when that three pounds of gray matter called the brain has been doing that job successfully for 6000 years.

Training the child to write programs, however, not only exercises that brain to its fullest potential through the building of logical and mathematical skills, but it also prepares the child for what will promise to be a very competitive job market in the future.

DTD
Computer Use Coordinator
St. Paul's Lutheran School

To the Editor:

In October 1982, I decided after some initial reading that a word processor had numerous advantages over replacing my old manual typewriter with an expensive electric version. Magazine ads for 80-column boards for the VIC-20, especially coupled with maximum memory expansion, led me to begin assembling a professional quality system. I first bought the VIC, then the Gemini-10 dot matrix printer, Cardco Card/? printer interface, C2N cassette unit, Data 20 64k 80-column Video Pak and their Micro Expansion Chassis, USI Pi3 12″ amber monitor and the powerful Quick Brown Fox word processing cartridge. I eventually added the 1541 disk drive and the unusual, and probably rare, PRS remote keyboard.

The point is that I had to buy a lot of computer magazines, write letters to many companies and worried about each

expenditure, for fear it wouldn't work as the literature implied. Then after I had all the above up and running, I discovered *COMMANDER*. Colin Thompson's columns for the VIC and Commodore 64 alone are worth the price of the subscription.

Thank you and keep up the good work. You are now my most valued computer magazine, especially because of Colin Thompson. I am not a programmer nor very interested in games. His "user-friendly" software and general articles have paid for my subscription several times over.

DB
Medford, Oregon

To the Editor:

I'm trying to track down a listing or catalog of available software packages that cover the routine statistical treatments compatible or written for the Commodore 64. Several thick catalogs for Apple statistic program packages exist, but I haven't had luck in tracking down a comparable listing for the 64.

Thank you,

JRH
Missoula, Montana

To the Editor:

Do you know of any commercially available software (cassette or cartridge) which performs diagnostics on the C-64 and peripherals to determine if all systems are operating as they should?

Thank you.

CC
San Jose, California

To the Editor:

I felt you would like to know how much I am enjoying the magazine. Because I am an active amateur radio operator, the column by Jim Grubbs, (Command Post) has been especially informative.

Thanks for the good work . . .

RRS
Rialto, CA

The editors of COMMANDER ***welcome your comments and questions about the magazine's content, software or hardware problems you have experienced, or ways to improve the use of Commodore computers and related products. Some letters that we print pose general questions, and we'd appreciate responses from readers who have relevant information. In all letters, please include your name, address, and phone number, and briefly describe both your computer equipment and your main uses of it.***

COMMODORE-64™ and VIC-20™ users!

Meet an... IMP DOT MATRIX PLAIN PAPER PRINTER

Short on Price and Size... Long on Quality!

$129.95
Send Check or M O + $6 95 Shipping / Handling

IMPACT PRINTER COMES COMPLETE WITH ALL 20/64 INTERFACES CABLES

Impact Printer by Fidelity Electronics 4"×4.5"2"

Features: High quality print head-MCBF equal to 500,000 lines, 5X7, 30cps impact dot matrix, 144 dots per line, 2.25"w plain paper roll and cartridge ribbon included up to 40 column width, lower case descenders, upper/lower case characters, can reproduce the entire 20/64 graphics set, dot addressable graphics, supports custom character capability, reverse character mode, permits user selection of two character sets. Transformer included. 90-day warranty. N.Y. residents add applicable sales tax.

All Major Credit Cards Accepted

Circle No. 95

DEALER INQUIRIES INVITED

"Call THE Printer Experts"

INSTITUTIONAL COMPUTER DEVELOPMENT CORP.

For Information and Orders

Toll-Free 1-800-645-4710
(in N.Y., outside cont. U.S. 516-221-3000)

2951 MERRICK RD. DEPT. 12 BELLMORE, NY 11710

Vic 20 and Commodore 64 are trademarks of Commodore Electronics Ltd.

COMMODORE 64

PUBLIC DOMAIN software service

education · entertainment · word processing
telecommunications · business · technical

All programs tested and refined for the Commodore 64.
$3 per program,-
disk or cassette

Send $2.50 for catalog
Public Domain Software Service
P.O. Box 1490
El Cerrito, CA 94530

Catalog charge applicable to first purchase.

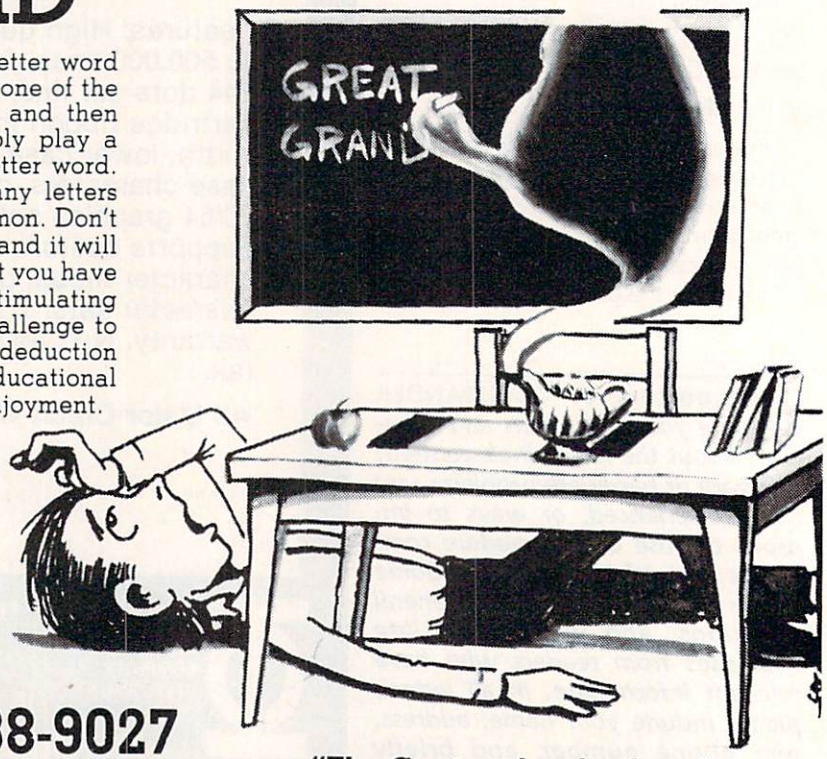
Circle No. 138

Disk Software for the Commodore 64™

MasterCard VISA

JOT-A-WORD™

A computerized version of the old five letter word game. Simply pick a secret five letter word (one of the almost 5000 words contained on the disk) and then play against the Jot-A-Word Genie or simply play a solitaire version. Start by typing in a five letter word. The Genie responds by telling you how many letters your guess and the secret work have in common. Don't try to cheat, because the Genie is too smart and it will not accept non-words or continue a game that you have given it wrong scores. This is a simple but stimulating game for ages 9 to senior citizen. A real challenge to your intellect, reasoning powers, logic and deduction skills. It's simply hard to beat; as a fun and educational experience! Graphics and music add to the enjoyment.



"The Genie is hard to beat!"

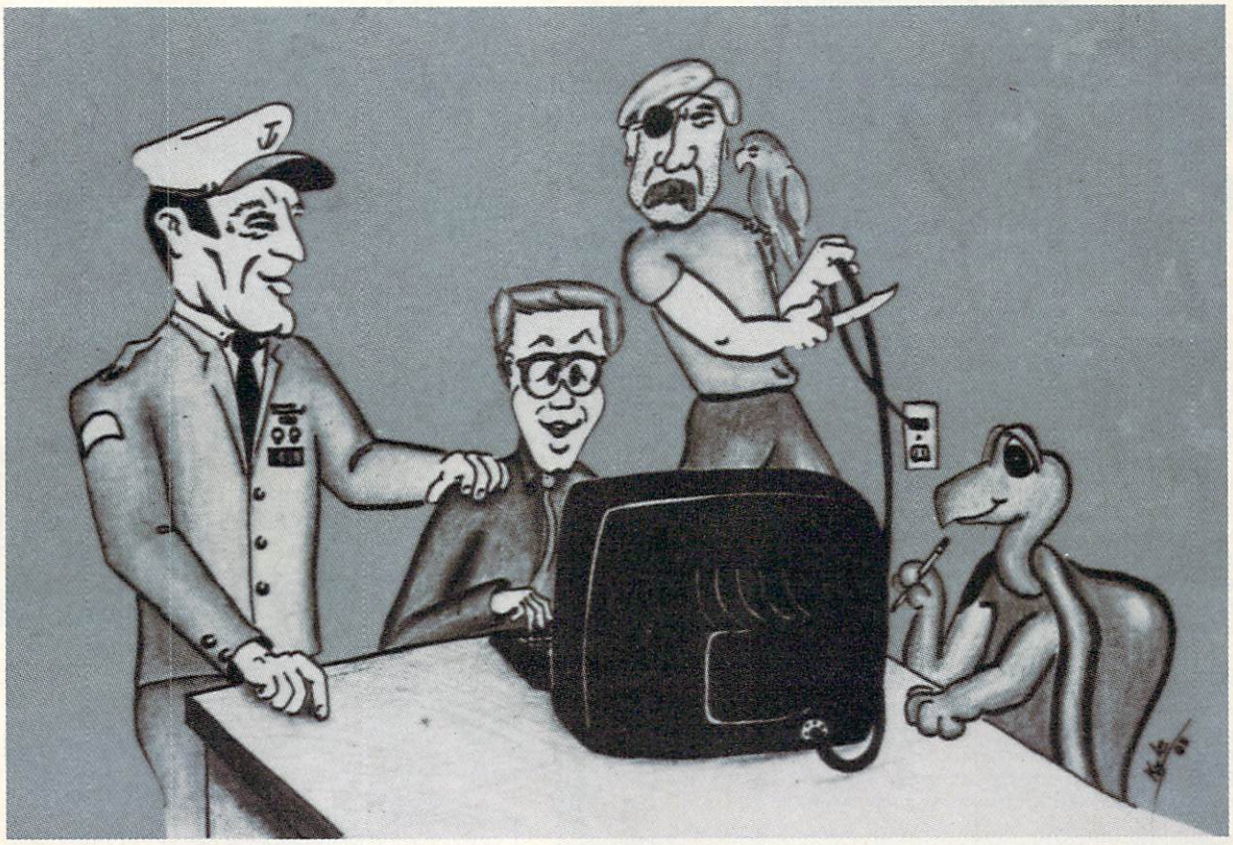
ONLY $29.95

MICRO WARE 1342B RT. 23 BUTLER, N.J. 07405

Dealers & Distributors Inquiries Invited **201-838-9027**

Circle No. 55

GAME CONTEST



The contest will end March 15, 1984. Entries must be mailed to *COMMANDER,* Your Program in Pilot Contest, PO Box 98827, Tacoma, WA 98498. Your program must be on diskette or cassette, and include a copy of your sales receipt or invoice. All entries will become property of Tamarack Software, Inc., and will be nonreturnable unless accompanied by a self-addressed mailer with sufficient postage attached.

DEADLINE FOR ENTRIES MARCH 15, 1984

VANILLA PILOT or PILOT II may be purchased from any one of Tamarack Software's fine dealers.

TERMS FOR GAME CONTEST

A new twist to the Game Contest. The time has come for you to try your hand at programming. Who can write the best program in VANILLA PILOT or the new PILOT II?

Stop! Don't try pressing the panic button—we hid it! Anyway, it's easy! People from kindergarten to grandpas are already using VANILLA PILOT and loving it. Now with our advanced Pilot, you get a double scoop—an easy to use Pilot language using virtually all the capabilities of the Commodore- 64 and an expanded manual to help you learn.

OK, got your thinking cap on? Here's the rules, You can write any kind of program that your mind can dream up. Make it innovative—we will be looking for the best idea and how well you programmed that idea. Anyone can enter, except employees of Tamarack Software, Inc., and their families. The grand prize of $150 will go to the best overall program. There are two first prizes of $75 and two second prizes of $50 to be awarded to two groups, one—Jr. High and younger, and two—High School and up.

VICTORY SOFTWARE

INTRODUCES

THE EARTH WARRIOR SERIES

METAMORPHOSIS $19.95

You stumbled into the nest of the Cyglorx and find yourself fighting off robot tanks guarding the Cyglorx eggs. You think you have everything under control and then the eggs start hatching. Commodore 64 version features 4 different screens.
Available for COMMODORE 64 and VIC-20. Played with JOYSTICK.

CREATOR'S REVENGE $19.95

The creator assembled a massive army of robots and insects to take revenge on the earth. Destroy insects, get treasures, and get the neutron bomb deactivator. Battle robots and destroy the neutron bomb before it annihalites your city. Miss and you must face the mutants. Features 4 different screens.
Available for COMMODORE 64. Played with JOYSTICK.

LABYRINTH OF THE CREATOR $19.95

Journey into the most complex and dangerous fortress ever build by the creator. You will encounter deadly robots, skulls, lakes, avalanches, false creators, and a creature who roams 256 rooms relentlessly pursuing you.
Available for COMMODORE 64. Played with JOYSTICK.

Programs for the VIC-20 and the COMMODORE 64.

All games available on TAPE or DISK.

All Arcade-Style games are packed full of MACHINE CODE.

KONGO KONG $19.95

Climb ladders, avoid the barrels the crazy ape is rolling at you, and rescue the damsel. Commodore 64 version features 4 different screens!
Available for COMMODORE 64 and VIC-20. Played with JOYSTICK or KEYBOARD.

GRAVE ROBBERS $19.95

Introducing the first GRAPHIC ADVENTURE ever available for the VIC-20 or COMMODORE 64! With realistic audio-visual effects, you explore an old deserted graveyard and actually see the perils that lie beyond.
Available for COMMODORE 64 and VIC-20. Played with KEYBOARD.

BOUNTY HUNTER $19.95

An adventure in the Old West. Journey back with us into the days of Jessie James and Billy the Kid where the only form of justice was a loaded revolver and a hangman's noose.

In this full-length text adventure, you play the role of Bounty Hunter, battling against ruthless outlaws, hostile Indians, wild animals and the elements of the wilderness with only your wits and your six gun. Average solving time: 20-30 hours. If you love adventures, this one is a real treat.
Available for COMMODORE 64 and VIC-20 (with 8K or 16K expander). Played with Keyboard.

CHOMPER MAN $19.95

Don't let the bullies catch you as you gobble the goodies! This program has 8 screens and still fits in the standard memory.
Available for COMMODORE 64 and VIC-20. Played with JOYSTICK or KEYBOARD.

Illustrations: Elizabeth Hauck

CAVE KOOKS $14.95

Earth's surface is threatened by collapse from a strange group of creatures who bore out the earth's crust to make their dens. Your objective is to enter the creature's habitat and spin the invaders to death.
Available for COMMODORE 64. Played with JOYSTICK.

Check your LOCAL DEALER or order directly.
ORDERING: We accept personal checks, money orders, VISA, and MASTERCHARGE. Charge orders please include number and expiration date. Overseas orders please use charge or have check payable through a U.S. bank. Add $1.50 postage and handling per order. PA residents please add 6% sales tax.

VISA — master charge

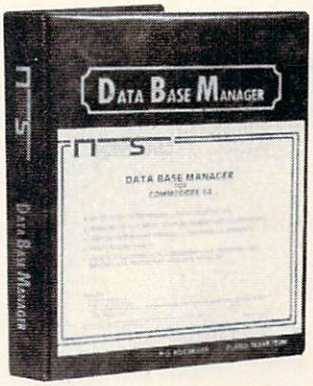
VICTORY SOFTWARE

VICTORY SOFTWARE INC.
7 Valley Brook Road, Paoli, PA 19301
(215) 296-3787

Circle No. 48

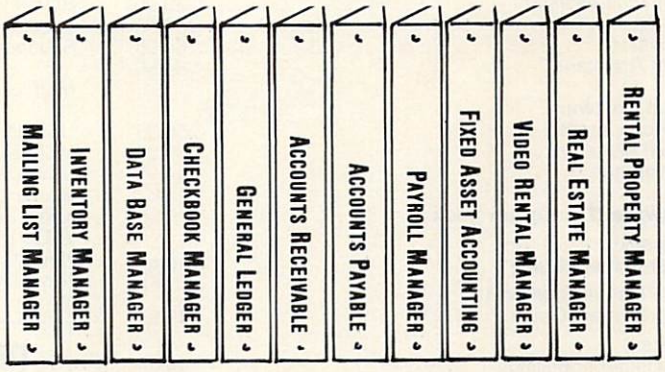
MICROSPEC

SOFTWARE MEANS BUSINESS FOR THE COMMODORE 64



When it's time to get serious, it's time to boot up MicroSpec business software. Our complete line of business software is made to give you some real applications for your Commodore 64. From data base management to full accounting software, we have the package for you.

It's attention to detail that makes our packages so beautiful and makes them stand out from the rest. We realize that most people are first time users, so we designed all our packages to be completely menu driven and user prompted for each input. We also know that most people use only one disk drive, so we designed all our packages to virtually eliminate disk swapping. Other features like non destructive input routines really make our software easy to use. But all this doesn't restrict you. Pure random access file structure maximizes your disk capacity and allows you to bring up any record for viewing in less than a second.



In our efforts to put together the best packages available, we worked on more than the software. We took the same approach with the documentation as the software. We made it complete and easily understood for the first time user. We even provide sample reports in many cases.

The Demonstration Package, which shows how each program runs, is available for $19.95. So, if you're serious about your 64, call or write for a complete brochure or **go right down to your nearest computer retailer for a demonstration.**

WHEN YOU AND YOUR 64 ARE READY TO GET DOWN TO BUSINESS
GIVE US A CALL

MICROSPEC

P.O. BOX 863085 • PLANO, TX 75086
(214) 867-1333

Circle No. 28

64 Software... Order It Today, Get It Tomorrow!

Proven Performance for your Commodore 64

PaperClip 64 (Disc) Professional Word Processor	79.99
PaperClip 64 (Cassette)	85.00
PowerFile Personal Filing System	98.00
Delphi's Oracle 64 - Professional DataBase System	89.99
FlexFile 2.1 Data Base	79.00

Orbyte Accounting Software

Inventory Control*	34.95
General Ledger*	34.95
Payroll*	34.95
Accounts Payable*	34.95
Accounts Receivable*	34.95
Word Controller	47.95
Mail Controller	39.95
Comm-File	69.95
Stock Analysis	47.95
Money Manager	64.95
Basic-A Tutorial	54.95

*Buy any two and pay only 47.95!

SpreadSheets

Calc Result Advanced	98.00
Calc Result Easy	69.95
Multi-Plan Professional Spreadsheet	74.95
PractiCalc	47.00

Rainbow Series

Personal Finance Assistant	39.95
Filing Assistant	64.95
Writer's Assistant	64.95
Spreadsheet Assistant	64.95

Continental Software

The Home Accountant	55.95
FCM Mail List Manager	39.00
The Tax Advantage	44.95

Koala Software (2-program packs)

Spider Eaters & Instant Programmers Guide	39.95
KoalaGrams Instant Spelling I & Instant Programmers Guide	49.95
Spider Eaters & Koalagrams Instant Spelling I	59.95
Logo Design Master & Instant Programmers Guide	49.95
Logo Design Master & Spider Eaters	59.95
Coloring Series I Geometric Designs & Coloring Series II Crystal Flowers and Snowflakes	49.95

Simon's Basic	19.95
DOODLE - Color Sketch Pad	29.00
Over the Rainbow - The BEST Cube Game	29.00
Beach Head - Access	25.00
Neutral Zone - Access disk	25.00
Neutral Zone - Access cassette	25.00
Flight Plan IFR - Academy Software	23.00
Temple of Apshai - disk	26.95
Temple of Apshai - cassette	26.95
Jumpman - disk or cassette	28.50

Educational Software

Spinnaker

Alphabet Zoo - disk	24.95
Alphabet Zoo - cartridge	24.95
Cosmic Life - cartridge	24.95
Delta Drawing - cartridge	28.95
Pacemaker - disk	24.95
Fraction Fever - cartridge	28.95
Kids on Keys - cartridge	24.95
Kindercomp - disk	24.95
Kindercomp - cartridge	24.95
Story Machine - cartridge	24.95
Up For Grabs - cartridge	24.95
Hey Diddle Diddle - disk	24.95
Hey Diddle Diddle - cartridge	24.95
In Search of The Most Amazing Thing - cartridge	21.95
Rhymes and Riddles - disk	21.95
Snooper Troops 1 - disk	28.95
Snooper Troops 2 - disk	28.95
Math by The Numbers - Jim Micheli	29.95
USI PI3 Amber Monitors	138.00
MSD Super Disc Drive	355.00
MW 302-C Parallel Interface	62.50
Buscard IEEE Interface	150.00
Koala Pad - touch tablet	69.00
WICO trackball	34.95
New! Disc Drive Cooling Fan - fan only	49.95
New! Disc Drive Cooling Fan - with surge protector	64.95

Ask for our catalog!
Open 7 days.

New!

PREFERRED CUSTOMER CARD

This card entitles bearer to 5% off on all future software orders.
When ordering, please give preferred customer account number.

CUSTOMER NAME _____

ACCOUNT NUMBER _____

TOLL FREE ORDERS:
1-800-558-4801
IN WISCONSIN CALL COLLECT (414) 291-5123
FOR TECHNICAL ASSISTANCE CALL (414) 291-5123

Get this Discount Card with your order.

WE PAY FOR SHIPPING*
*All software shipped at no additional charge via UPS 2nd Day Air. Add $4. for Next-Day Air Express Service.

CALL TOLL FREE **1-800-558-4801** In Wisconsin Call (414) 291-5123 Collect

COMPUTER LEARNING CENTER
P.O. Box 17424 Milwaukee, WI 53217

Circle No. 141

Exclusive needs... Exclusive source!

Southwest Micro Systems Inc

Hardware & Peripherals

Commodore 64[1]	$195.00
Commodore B128 Computer[1] (128K)	895.00
MSD Single Disk Drive (30 Free Program) (Vic 1541 Compatible)	CALL
Star Gemini — 10 Printer with cable interface[8]	389.00
Star Gemini — 15 Printer with cable Interface[8]	575.00
CIE Cartridge (IEEE-488 for C64)	85.00
RS-232R Interface for Vic or C64	45.00
CPI Parallel Interface for VIC or C64	65.00
VEX-3 Expander for VIC	19.00
VEX-6 Expander for VIC	55.00
4 Slot Expander for C64	55.00
V3K Static RAM Expansion	15.00
V8K Static RAM Expansion	39.00
V16K Static RAM Expansion	69.00
V24K Static RAM Expansion	99.00
40/80 Col VIC Video Expander w/8K[10]	130.00
40/80 Col VIC Video Expander w/64K[10]	325.00
80 Col C64 Video Expander[10]	149.00
Z80 Video Pak for C64[10]	250.00
Light Pen for Vic or C64	30.00
VMC/CMC/VIC & C64 Monitor Cables	10.00
Joy Stock (Arcade Quality)	19.00
TTX 1014 (Daisy Wheel Printer) 15 CPS[11]	499.00
Gorilla Banana Monitor	85.00
Numeric Keypaid C64 & VIC-20	65.00

C64 Business & Professional Software

Wordpro 3 + Wordprocessing[5]	65.00
Info Designs Soft Pak (G/L, A/R, A/P)[6]	150.00
Data Base for C64	95.00
Financial Spreadsheet for C64	135.00
Super Sprite	Cassette 35.00
	Disk 35.00
Mailing List 64	Cassette 20.00
	Disk 25.00
Personal Finance C64	65.00
Quick Brown Fox C64[12]	55.00
Graphic Printer Utility (Epson Gemini)	15.00
Paper Clip	115.00
Easy Script	65.00
Checkbook Manager	45.00
Smart 64 Terminal	Cassette 20.00
	Disk 35.00
Vanilla Pilot	25.00
C64-Forth	55.00

VIC-20 Business & Professional Software

VTE/CTE Terminal Program for VIC & C64	Cassette 8.95
	Diskette 12.95
VT-40 VIC 40 Col Terminal Communicator	39.00
VIC Super Expander[1]	55.00
VIC Programmers Aid Cartridge[1]	45.00
VIC Intro to Basic Part I & II	45.00
Home Inventory[2]	Cassette 10.00 Disk 12.00
Household Finance[2]	Cassette 25.00 Disk 25.00
Hes Writer for VIC-20[4]	Cartridge 39.95
Hes-MON for Vic-20[4]	Cartridge 39.95
Hes-Turtle Graphics[4]	Cartridge 39.95
VIC-20 Data Base (Powerful)	75.00
Quick Brown Fox VIC-20[12]	55.00

Recreational Software

VIC-20:

Logic Games[2]	Cassette 10.95
Action Games[2]	Cassette 15.00
City Bomber & Minefield[2]	Cassette 15.00
Apple Panic Game[2]	Cartridge 25.00
Spills & Fills[2]	Cartridge 25.00
Pipes[2]	Cartridge 25.00
Choplifter Game[2]	Cartridge 25.00
Serpentine	Cartridge 25.00
EPYX-Rescue at Rigel (16K Extra)[3]	Cassette 29.95

C64:

Facemaker[14]	29.95
Hey Diddle Diddle[14]	25.00
Moondust[2]	25.00
Save New York[2]	25.00
Drelbs[15]	25.00
Fort Apocalypse[15]	25.00
Pharoah's Curse[15]	25.00
Protector[15]	25.00
Sentinel[15]	25.00
Shamus[15]	25.00
Survivor[15]	25.00
EPYX-Upper Reaches of Apshai[3]	Disk 15.00
EPYX-Curse of Ra[3]	Disk 15.00

VIC-20 & C64:

In Search Of...[14]	29.95
Snooper Troops[14]	29.95
Rat Hotel[2]	25.00
Astroblitz Game[2]	Cartridge 25.00
Trashman Game[2]	Cartridge 25.00
EPYX-Temple of Apshai[3]	Disk 30.00
EPYX-Sword of Fargoal[3]	Disk 25.00
EPYX-Crush, Crumble Chomp[3]	Disk 25.00

[1]Commodore Int. [2]Creative Software [3]EPYX Software [4]Human Engineered Software [5]Professional Software [6]Info Designs Software [7]MSD Inc. [8]Star Micronics, Inc. [9]Amdex Corp. [10]Data 20 Corp. [11]Teletex C.C. [12]Quick Brown Fox Inc. [13]Cardco [14]Spinnaker [15]Synapse

Call Toll Free 1-800-527-7573 For Latest Price Information **In Texas Call: (214) 484-7836**

Complete Catalog Available Upon Request **We Accept Master Card, Visa and American Express**

Southwest Micro Systems Inc. • 2554 Southwell • Dallas, Texas 75229

Circle No. 54

Cyberworld, the science fiction adventure challenges you to accomplish the missions of the CYBERLEAGUE. You must infiltrate a Drokon warship by moving through the ship's corridors via joystick while dodging death. The entire sequence is in stunning 3D! Then you must steal the ship and fly through alien-ridden guadrants of space as you return to CYBER where you must fend off the Zaxxars with laser cannon and quick reflexes. And there is more as the action moves to Deep Space!

Suggested retail price: $49.95 • We accept check, money order or VISA/MASTERCARD.

AVAILABLE ON DISKETTE ONLY • DEALER AND DISTRIBUTOR INQUIRIES INVITED

Buy other fine Progressive Peripherals & Software products at your local dealer, or order directly:

Progressive Peripherals & Software • 2189 S. Holly St., #2, Denver, Colorado 80222

ORDER HOTLINE: (303) 759-5713

® Commodore 64 is a registered trademark of Commodore Business Machines.

Circle No. 58

THE ULTIMATE CONNECTION

INTERPOD FOR COMMODORE 64 OR VIC 20

THE LIMBIC CONNECTION

CONNECTING THE FEATURES OF THE FUTURE FOR TODAY'S COMMODORE USERS.

INTERPOD

Exercise the full potential of the Commodore 64™ or VIC 20™ with the quality, multiple interface from Limbic Systems, Inc. INTERPOD is an intelligent, transparent interface that turns your computer into a powerful system without impacting on your computer's memory.

Simply plug INTERPOD into the serial port of your computer, power-up and you are ready to communicate with any number of IEEE devices and any RS232 printer.

PETSPEED

Speed. . . Ease of Use. . . Ability to compile BASIC programs -- PETSPEED brings the Commodore 4000 & 8000 series computers into the age of action. PETSPEED is the compiler recommended by Commodore. Not just a compiler, PETSPEED contains a powerful optimizer that simplifies the complex, reduces run time and maximizes efficiency of operation.

British Technology for American Results. Interpod and Petspeed are distributed in the United States by Limbic Systems, Inc. Dealer and school discounts are available.

Limbic Systems Inc.

560 San Antonio Road, Suite 202 Palo Alto, CA 94306

(415) 964-8788

Commodore 64 & VIC 20 are trademarks of Commodore Electronics, Ltd.

Circle No. 172

Continued from page 30

FIGURE 3

```
FILENAME: MULTIPOKE.OBJ

LINE ADDR   CODE      LABEL   OPC OPERAND        COMMENTS

0001 033C             ******************
0002 033C             * MULTIPOKE V1.0 *
0003 033C             ******************
0004 033C             ;   (C)1983 BY
0005 033C             ; BY ERIC GIGUERE
0006 033C             ;
0007 033C             CHRGET EQU $0073
0008 033C             CHRGOT EQU $0079
0009 033C             LOC    EQU $FB
0010 033C             POINTR EQU $FD
0011 033C             EVAL   EQU $AD9E      ;$CD9E FOR VIC
0012 033C             CONVRT EQU $B7F7      ;$D7F7 FOR VIC
0013 033C             INT    EQU $64
0014 033C             ;
0015 033C                    ORG $033C      ;PROGRAM STARTS IN CASSETTE
0016 033C             ;                      BUFFER
0017 033C A9 4C       SETWDG LDA #$4C       ;PLACE THE OPCODES FOR 'JMP'
0018 033E 85 7C              STA $7C        ;AND THE WEDGE ADDRESS INTO THE
0019 0340 A9 49              LDA #<WEDGE    ;CHRGET ROUTINE
0020 0342 85 7D              STA $7D
0021 0344 A9 03              LDA #>WEDGE
0022 0346 85 7E              STA $7E
0023 0348 60                 RTS            ;WEDGE IS ACTIVATED, RETURN TO
0024 0349             ;                      BASIC.
0025 0349 48          WEDGE  PHA
0026 034A C9 26              CMP #'&        ;CHECK INCOMING CHARACTER
0027 034C D0 0D              BNE EXIT       ;NOT WHAT WE WANT, SO LEAVE
0028 034E A5 7B              LDA $7B
0029 0350 C9 02              CMP #2         ;CHECK TO MAKE SURE PROGRAM IS
0030 0352 F0 07              BEQ EXIT       ;RUNNING (IF NOT, LEAVE)
0031 0354 A5 D4              LDA $D4        ;CHECK TO SEE IF QUOTE MODE ON
0032 0356 D0 03              BNE EXIT       ;IF SO, LEAVE
0033 0358 68                 PLA
0034 0359 D0 09              BNE PROCES     ;GO TO PROCESSING ROUTINE
0035 035B             ;
0036 035B 68          EXIT   PLA            ;RETRIEVE CHARACTER
0037 035C C9 3A              CMP #':        ;CHECK TO SEE IF COLON
0038 035E 90 01              BCC JUMP       ;IF <$3A BRANCH TO JUMP
0039 0360 60                 RTS            ;RETURN
0040 0361 4C 80 00    JUMP   JMP $0080      ;CONTINUE CHRGET
0041 0364             ;
0042 0364 20 73 00    PROCES JSR CHRGET     ;GET FIRST CHARACTER
0043 0367 20 9E AD           JSR EVAL       ;EVALUATE EXPRESSION
0044 036A 20 F7 B7           JSR CONVRT     ;CONVERT IT TO INTEGER
0045 036D A5 64              LDA INT        ;GET HIGH-BYTE
0046 036F 85 FC              STA LOC+1      ;STORE IN POINTER
0047 0371 A5 65              LDA INT+1      ;DO SAME FOR LOW-BYTE
0048 0373 85 FB              STA LOC
0049 0375 A9 00              LDA #0         ;CLEAR INDEX VALUE
0050 0377 85 FD              STA POINTR
0051 0379             ;
0052 0379 20 73 00    GET    JSR CHRGET     ;GET FIRST CHARACTER
0053 037C F0 16              BEQ RETURN     ;IF COLON OR ZERO, LEAVE
0054 037E 20 9E AD           JSR EVAL       ;EVALUATE EXPRESSION
0055 0381 20 F7 B7           JSR CONVRT     ;CONVERT IT
0056 0384 A4 FD              LDY POINTR     ;LOAD INDEX
0057 0386 A5 65              LDA INT+1      ;LOAD LOW-BYTE ONLY
0058 0388 91 FB              STA (LOC),Y    ;STORE IN MEMORY
0059 038A E6 FD              INC POINTR     ;INCREASE INDEX
0060 038C 20 79 00           JSR CHRGOT     ;GET LAST CHARACTER
0061 038F F0 03              BEQ RETURN     ;IF COLON OR ZERO, LEAVE
0062 0391 4C 79 03           JMP GET        ;CONTINUE LOOP
0063 0394             ;
0064 0394 4C 73 00    RETURN JMP CHRGET     ;LEAVE ROUTINE
0065 0397             ;
0066 0397 A9 C9       RESTRE LDA #$C9       ;RESTORE ORIGINAL
0067 0399 85 7C              STA $7C        ;VALUES IN CHRGET
0068 039B A9 3A              LDA #$3A
0069 039D 85 7D              STA $7D
0070 039F A9 B0              LDA #$B0
0071 03A1 85 7E              STA $7E
0072 03A3 60                 RTS            ;RETURN TO BASIC

ASSEMBLY COMPLETE.

SYMBOL TABLE:

CHRGET-$0073   CHRGOT-$0079   LOC----$00FB   POINTR-$00FD   EVAL---$AD9E
CONVRT-$B7F7   INT----$0064   SETWDG-$033C   WEDGE--$0349   EXIT---$035B
JUMP---$0361   PROCES-$0364   GET----$0379   RETURN-$0394   RESTRE-$0397

PROGRAM START: $033C     PROGRAM END: $03A4
```

with complex formulas and expressions as well as variables. The line:

20 & M*YL, Z+1, 13, X(3):

is perfectly acceptable providing all the values are within range. One caution: always deactivate MULTIPOKE before using the datasette in any way, or else move it somewhere else in memory.

HOW MULTIPOKE WORKS

I've included extensive comments in the disassembly of MULTIPOKE, so I'll only make a few additional ones here. Two special ROM routines are used by MULTIPOKE: EVAL and CONVRT. EVAL is a routine that evaluates (finds the value of) an expression pointed to by CHRGET and ending with a comma or a colon. CONVRT is a routine which takes the value found by EVAL and converts it into a two-byte integer found at $64 and $65 (in HIGH/LOW format, not the usual LOW/HIGH). MULTIPOKE uses these to get and store the values following the ampersand.

CONCLUSION

Wedges are definitely useful for adding extensions to BASIC, as in MULTIPOKE, and to explore the innards of the BASIC interpreter. I hope you find MULTIPOKE and the concepts presented here useful and practical. You may send your questions and suggestions to me in care of *COMMANDER*, P. O. Box 98827, Tacoma, WA 98498.

commodore

C64 computer	$199
C1525 printer	209
Easy Script (d)	35
Easy Finance (d)	19
Bonus Pack (d)	15
Logo (d)	35
Educational Games (d)	9
General Ledger (d)	35
The Manager (d)	39
Easy Mail (d)	15
Protector II (d)	25
Gorf (c)	15
Fort Apocalypse (d)	25
Wizard of Wor (c)	15
WordPro Plus 3/64 (d)	55
Simon's Basic (c)	15
Hey Diddle Diddle (d)	22
Curse of Ra (d)	19

R. Redmond

Commodore 64 Specialists
2041 Carthage Road - Dept. C
Tucker, GA 30084

Bank check, money order, personal check, Visa or Mastercard accepted (include card no., exp. date and signature). Add $2.00 for shipping. Write for free catalog.

VISA

Circle No. 227

VIC 20

1541 DISK DRIVE $239

1701 Color Monitor	$255	1530 Recorder	$59
1525 Printer	$239	1600 Modem	$59
1520 Color Ptr	$169	1650 Auto Modem	$158
Hescard	$23	Microtek 16K Ram	$82
Hes Sound Box	$13	UMI 3K Ram	$56
Data 20 Exp. Chassis	$56		

VIC 20 SOFTWARE VIC 20

APPLIED SYSTEMS
Number Gulper (C) ... $17
Number Chaser (C) ... $17

BRODERBUND
Martian Raider (C) ... $14
Multisound Synth. (C) $14
Shark Trap (C) ... $14
Sky Blazer (R) ... $27
Seafox (R) ... $27
AE (R) ... $27

COMM-DATA
Pakacuda (C) ... $13
Sketch and Paint (C) .. $13
Eight Ball (C) ... $13
Invader Educ. Series (each) (C) ... $13

COMPUTERMAT
Paratroopers (C) ... $15
Bug Blast (C) ... $12
Cricket (C) ... $12

CREATIVE S.W.
Black Hole (R) ... $36
Trashman (R) ... $36
Astroblitz (R) ... $36
City Bomber (R) ... $20
Apple Panic (R) ... $36
Choplifter (R) ... $36
Serpentine (R) ... $36
Videomania (R) ... $36
Terraguard (R) ... $36

EPYX
Monster Maze (R) ... $27
Sword of Fargoal (C) . $20
Ricochet (C) ... $14
Rescue at Rigel (C) ... $20
Temple of Apshai (D) . $27

HES
Gridrunner (R) ... $27
Raid of Isram (C) ... $14
Robot Panic (R) ... $27
Protector (R) ... $29
Shamus (R) ... $27
Predator (R) ... $27
Syn The Sound (R) ... $39
Aggressor (R) ... $27
Heswriter (R) ... $27
Turtle Graphics (R) ... $27
Hesmon (R) ... $27
Vic Forth (R) ... $39
6502 Prof.Dev.Sys. (C) $20
Torg (C) ... $13
Concentration (C) ... $12
Fuel Pirates (C) ... $12
Simon (C) ... $12
Vic Trek (C) ... $13
Co Co II (C/D) ... $27

QUICK BROWN FOX
Prof. Word. Proc. ... $48

SYNAPSE
Harrier (C) ... $23
Squeeze (C) ... $23
Astro Patrol (C) ... $23

TAYLORMADE
Fun Fractions (C) ... $18
Vic Lemonade (C) ... $12
Tch Typing Tutor (C) .. $13

T&F SOFTWARE
Word Search (C) ... $14
Sports Search (C) ... $14
Arcade Search (C) ... $14

TOTL
Mailing List (C) ... $14
Time Management (C) $22
Research Asst. (C) ... $22

THORN EMI
River Rescue (R) ... $29
Vic Music Comp. (R) .. $29
Submarine Comm. (R) $29
Mutant Herd (R) ... $29
Fourth Encounter (R) . $29

TRONIX
Galactic Blitz (C) ... $17
Swarm (C) ... $20
Sidewinder (C) ... $20
Scorpion (R) ... $27
Gold Fever (R) ... $27
Deadly Skies (R) ... $27

UMI
Video Vermin (R) ... $27
Amok (C/R) ... $20
Outworld (R) ... $27
Satellites & Met. (R) .. $27
Subchase (C) ... $17
Kosmic Kamikaze (C) . $17
Meteor Shower (C) ... $11
Super Hangman (C) .. $14
Spiders of Mars (R) ... $27
Meteor Run (R) ... $27
Vicalc (C) ... $11
Vi Term A (C) ... $14
Vi Cat (C) ... $17
Vi Check (C) ... $17
Alien Blitz (C/R) ... $20
Sky Math (C) ... $11
Space Division (C) ... $11
The Alien (C) ... $17
Grand Master (C) ... $27
Renaissance (R) ... $33
Cloud Burst (R) ... $20
Skibbereen (R) ... $20
Wordcraft 20 (R) ... $65

VICTORY
Adv. Pak I (C) ... $14
Adv. Pak II (C) ... $14
Annihilator (C) ... $18
Grave Robbers (C) ... $12
Kongo Kong (C) ... $18
Trek (C) ... $12

Printers/Etc.

GEMINI 10X .. $289
GORILLA $199

CITOH
Prowriter ... $345
Prowriter II ... $629
Starwriter ... $1149
Printmaster ... $1448

NEC
8023 A-C ... $409
3510 ... $1375
3530 ... $1579
3550 ... $1779
7710/7730 ... $1998

PROWRITER . $345
SMITH TPI ... $488

SILVER REED P $669
QUME 11/40 + ... $1299

OKI-DATA
Microline 82A ... $398
Microline 83A ... $638
Microline 84P ... $958
Microline 92 ... $488
Microline 93 ... $858

DIABLO
620R ... $939
630R ... $1719

MONITORS

AMDEK
Color I ... $289
V300 ... $139
V300A ... $149
Color II ... $449

NEC
GRN (JB1260) ... $115
GRN (JB1201) ... $155
Color Composite ... $298
RGB Color ... $598

MODEMS

HAYES
Smartmodem ... $209
Smartmodem 1200 .. $498
Micromodem II ... $259

NOVATION
J-Cat ... $99
Apple Cat II ... $259
D-Cat ... $149

64 LATE ARRIVALS 64

BATTERIES INCLUDED
Delphis Oracle(D) 114
Paper Clip(D) ... 89

COMM—DATA (New Versions)
Supercuda(C/D) ... 18
Pegassus Odyssey(C/P) 18
Escape MCP(C/D) ... 18
Toddler Tutor(C/D) 18
Prim. Math Tutor(C/D) . 18
Math Tutor(C/D) ... 18
English Invaders(C/D) . 18

DATA 20
Pro Word Proc.(C) ... 21
General Ledger(C) ... 21
Accounts Rec.(C) ... 21
Elec. Spreedsheet(C) .. 21

EN—TECH
Studio 64(D) ... 28
Sprite Fun(C) ... 18

EPYX
sword Fargoal(C/D) 20
Crush Crumble(D) ... 20
Upper Reaches APS(D) 14

HES
Synthe Sound 64(R) ... 34
64 Forth(R) ... 40
Time/Money Mgr.(D) .. 48

INFO—DESIGNS
G/L (D) ... 61
A/P (D) ... 61
A/R (D) ... 61

NUFEKOP
Exterminator(C) ... 20
3-D Man(C) ... 16

RAINBOW
Pers. Finance Assist.(D) 41

PSYCOM SOFTWARE
Personality Analyzer(D) 24

SIERRA ON—LINE
Crossfire(D) ... 20

SOUTHERN SOLUTIONS
Bill Payer(A/P) ... 68
Business Man(G/L) 68
Paymaster(Payroll) 68
Bill Collector(A/R) ... 68
Widget(Inventory) ... 68

T & F SOFTWARE
Word Search(C) ... 15
Sport Search(C) ... 15
Arcade Search(C) ... 15

TIMEWORKS
Programming Kit 1(D) . 18
Programming Kit 2(D) . 18
Programming Kit 3 (D) . 18

D = Disk
R = ROM (Cartridge)
C = Cassette

SPECIALS

Gemini 10X Printer ... $289
Gemini 15X Printer ... $379
Gorilla Banana Printer ... $199

COSMIC COMPUTERS

UNLIMITED

727 BREA CANYON RD., SUITE 16
WALNUT, CA 91789

ORDER LINES OPEN MON-SAT 8 am - 8 pm

(800) 626-7642

PLEASE FOR ORDERS ONLY
SORRY, NO COD'S

(714) 594-5204

FOR TECHNICAL INFO, ORDER INQUIRIES, OR FOR CALIFORNIA ORDERS

Add $2.50 shipping per software order in continental U.S. Add $5.00 shipping per software order for AK, HI, FPO-APO. Add $10.00 or 15% (whichever is greater) per software order for non-U.S. Call for cost of hardware shipping. Calif. residents add 6½% sales tax. Cashiers checks or money orders filled within 24 hours for items in stock. Personal checks require 4 weeks to clear. MasterCard and Visa OK for software only within continental U.S., add 3% surcharge. Include card no., expiration date and signature. Due to our low prices, all sales are final. All defective returns must have a return authorization number. Please call to obtain one before returning goods for replacement or repair. Prices & availability subject to change.

COMMODORE

CBM 64 ..... CALL
1541 DISK DRIVE ... $239

1701 Color Monitor	$255	1530 Recorder	$59
1525 Printer	$239	1600 Modem	$59
1520 Color Ptr	$169	1650 Auto Modem	$158
Card ? (Infc)	$60	CMB 64 Ref Guide	$18
Light Pen	$29	The Connection (Infc)	$85
Cassette Infc	$29	MSD Disk Drive	$339
Card ? Software	$16	PTI 45 Lot Board	$59

Script 64 ... $77
Calc Result Prof. ... $114
Calc Result Easy ... $68
The Home Accountant ... $48
Delphis Oracle ... $114
Word Pro 3 with Spell ... $78

64 SOFTWARE 64

ACCESS SOFTWARE
Neutral Zone (C/D) ... $26
Sprite Master (C/D) ... $27

AVALON HILL
Nukewar (C) ... $12
Planet Miners (C) ... $12
Androm. Conquest (C) $14
Midway Campaign (C) $12
North Atl. Convoy (C) . $12
Comp. Stcks/Bnds (C) $15
Computer Football (C) $18
Telengard (C) ... $16

BATTERIES INCLUDED
Paper Clip (D) ... $89
D.Base ... $114

BRODERBUND
Choplifter (R) ... $29
Serpentine (R) ... $27
Seafox (R) ... $27
David's Midnight (D) .. $23

COMMODORE
Easy File (D) ... $75
Easy Finance (D) ... $38
Easy Mail (D) ... $38
Easy Script (D) ... $75
Easy Schedule (D) ... $59
Logo (R) ... $75
Pilot (D) ... $75
Assembler (D) ... $38
Music Machine (D) ... $25
Music Composer (D) .. $25
Meza Music (D) ... $75
Video/Music Supt. (D) $38
Jupiter Lander (R) ... $25
Radar Rat Race (R) ... $25
Sea Wolf (R) ... $25
Kickman (R) ... $25

COMM-DATA
Pakacuda . (C) $14 (D) $18
Escp. MCP . (C) $14 (D) $18
Centropods (C) $14 (D) $18

COMPUTERMAT
Arcade-Pak (C) ... $18
Education-Pak (C) $18

CREATIVE SOFTWARE
Moondust (R) ... $25
Trashman (R) ... $25
Save New York (R) ... $25
Astroblitz (R) ... $25
Household Fin. (D) ... $25

DATA 20
Video Pak 80 ... $139
Z80 Video Pak ... $229

EN-TECH
Finance Calc 64 ... $34
Data Base 64 ... $56
Invoice Ease 64 ... $56

EPYX
Temple of APS (D) ... $27
Upper Reach. APS (D) $14
Jumpman (D) ... $27

HES
HES Modem ... $59
6502 Prof.Dev.Sys.(C) . $22
Hesmon 64 (R) ... $27
Turtle Grapics II (R) .. $41
Heswriter 64 (R) ... $32
Gridrunner (R) ... $27
Retroball (R) ... $27

INFOCOM
Zork I, II or III (D) ... $27
Deadline (D) ... $35
Starcross (D) ... $27

JIN SAM
Mini-Jini (R) ... $75

LITTLE WIZARD
Pro.Mail.List (C)$22 (D)$25
Stockmaster (Inventory) (C)$25 (D)$28

LOGISTIC
Datacalc 64 (C) $55 (D) $59
Home Journal (D) $55

MICROSPEC
Payroll System (D) ... $73
Inventory Pkg (D) $73
General Ledger (D) ... $73
Disk Data Mgr (D) $62
Mail List Mgr (D) $41
Checkbook Mgr (D) ... $39

M-SOFT
M-File (D) ... $89

ON-LINE
Frogger (D) ... $23
Jawbreaker (D) ... $20

PACIFIC COAST SOFT.
PCS (80 Col BD, Word Proc, D.Base,Spreadsheet) CALL
Account PAC (C/D) ... $34
File PAC (D) ... $30
Editor PAC (D) ... $39
Inquire PAC (D) ... $57
Happy Tutor Typng (D) $18

PROFESS. SOFTWARE
Wordpro 3 + /64 (D) ... $68

QUICK BROWN FOX
Prof.Word Proc. (R) ... $50

RAINBOW
Writers Assistant $95
Spreadsheet Assist. .. $95
File Assistant ... $95

SIRIUS
Blade/Blackpoodle (D) $27
Type Attack (D) ... $27
Repton (D) ... $27
Critical Mass (D) ... $27
Snake Byte (D) ... $23
Way Out (D) ... $27
Fast Eddie (D) ... $23
Turmoil (D) ... $23
Spider City (D) ... $27
Squish'Em (D) ... $23
Final Orbit (D) ... $27
Alpha Shield (D) ... $27

SKYLES ELEC. WORKS
Busicalc (C/D) ... $52
Busiwriter (D) ... $72

SPINNAKER
Snooper Troops 1 (D) . $29
Facemaker (D) ... $23
Kindercomp (D) ... $20
Hey Diddle (D) ... $20
Most Amaz. Thing (D) . $27

SYNAPSE
Fort Apocalypse (C/D) $23
Survivor (C/D) ... $23
Drelbs (C/D) ... $23
Pharoh's Curse (C/D) . $23
Protector II (D) ... $23
Morgal (D) ... $23
Shamus (D) ... $23

TAYLORMADE
Touch Typing Tutor 3.0 (D) ... $21

TIMEWORKS
Rbbrs/Lost Tomb (C/D) $21
Wall Street (C/D) $21
Money Manager (C/D) $21
Data Master (C/D) $21
Dungeons of Alg. Dragons (C/D) ... $21

TOTL
Text 2.6 ... (C) $32 (D) $34
Label 2.6 .. (C) $15 (D) $17
Time Manager 2.6 (C) . $24
Time Manager 2.6 (D) . $27
Resrch Assist. 2.0 (C) . $24
Resrch Assist. 2.0 (D) . $27

UMI
Motor Mania (C) ... $20
Renaissance (C) ... $27

VICTORY
Annihilator (C/D) ... $16
Kongo Kong (C/D) $16
Trek (C/D) ... $14
Adv. Pack #1 (C/D) ... $16
Adv. Pack #2 (C/D) ... $16
Grave Robbers (C/D) .. $13
Chomper Man (C/D) .. $18

Circle No. 49

FIGURE 4A - COMMODORE 64 VERSION

```
10 REM MULTIPOKE.DATA
20 REM C64 VERSION
25 :
30 GOSUB800
35 FORI=0TO15:FORJ=0TO15:&53280,J,I:NEXTJ,I
40 &53280,3,1:PRINT" MULTIPOKE OK..."
45 PRINT" TO QUIT TYPE SYS 919."
50 END
800 FORI=828TO931:READJ:POKEI,J:NEXT:SYS828:RETURN
900 DATA 169, 76, 133, 124, 169, 73, 133, 125, 169, 3, 133, 126, 96, 72
910 DATA 201, 38, 208, 13, 165, 123, 201, 2, 240, 7, 165, 212, 208, 3
920 DATA 104, 208, 9, 104, 201, 58, 144, 1, 96, 76, 128, 0, 32, 115
930 DATA 0, 32, 158, 173, 32, 247, 183, 165, 100, 133, 252, 165, 101, 133
940 DATA 251, 169, 0, 133, 253, 32, 115, 0, 240, 22, 32, 158, 173, 32
950 DATA 247, 183, 164, 253, 165, 101, 145, 251, 230, 253, 32, 121, 0, 240
960 DATA 3, 76, 121, 3, 76, 115, 0, 169, 201, 133, 124, 169, 58, 133
970 DATA 125, 169, 176, 133, 126, 96
```

FIGURE 4B - VIC VERSION

```
10 REM MULTIPOKE.DATA
20 REM VIC VERSION
25 :
30 GOSUB800
35 FORI=0TO255:&36876,I,I,I,I:NEXT
40 &36876,0,0,0,27:PRINT" MULTIPOKE OK..."
45 PRINT" TO QUIT TYPE SYS 919."
50 END
800 FORI=828TO931:READJ:POKEI,J:NEXT:SYS828:RETURN
900 DATA 169, 76, 133, 124, 169, 73, 133, 125, 169, 3, 133, 126, 96, 72
910 DATA 201, 38, 208, 13, 165, 123, 201, 2, 240, 7, 165, 212, 208, 3
920 DATA 104, 208, 9, 104, 201, 58, 144, 1, 96, 76, 128, 0, 32, 115
930 DATA 0, 32, 158, 205, 32, 247, 215, 165, 100, 133, 252, 165, 101, 133
940 DATA 251, 169, 0, 133, 253, 32, 115, 0, 240, 22, 32, 158, 205, 32
950 DATA 247, 215, 164, 253, 165, 101, 145, 251, 230, 253, 32, 121, 0, 240
960 DATA 3, 76, 121, 3, 76, 115, 0, 169, 201, 133, 124, 169, 58, 133
970 DATA 125, 169, 176, 133, 126, 96
```

Continued from page 106

ADVENTURE AND INTRIGUE FROM BRILEY

Briley Software has released five new, exciting programs for the Commodore 64.

In the Explorer Series are two new text adventures which are different each time the game is played. *HIGH SEAS* is a game of 19th century swashbuckling adventure, in which you try to rid the Atlantic Ocean of cut-throat pirates, and recover the gold that they have stolen. Seek out islands, ports-of-call, and buried treasure, while fighting off the murderous pirate ships. In *FUR TRAPPER,* you are gathering the pelts of animals in the high Rockies to make your fortune before the snows of winter set in. You will encounter breath-taking views, Indian trading posts (with breath-taking prices), lost Indian treasures, and a wide variety of ferocious animals.

In the Detective Series are three new games of deduction and reasoning. Each features a graphic map of the building in which the crime took place, a wide variety of cooperative (?) suspects, and a different solution every time! The object of each is to determine from your limited information the name of the criminal, and the hour at which the crime took place. In *MANSION!,* you must determine who stole a family heirloom during an elaborate dinner party. In *PENTAGON!,* you must find the traitor who has stolen one of some secret defense plans. *MUSEUM!* calls to report that the Gutenburg Bible is missing (among other possible treasures). Put on your gumshoes and find out who did it!

Each of these games is available on tape from: Briley Software, Box 2913, Livermore, CA 94550-0291. Price: $14.95 each. Circle No. 262

MOSAIC RAMMASTER 32 for the VIC-20

Mosaic Electronics introduces the RAMMASTER 32 for the VIC-20 computer. The RAMMASTER 32 includes many features that before were only available on products costing much more.

These features include a built-in expansion port so that it can be used with any cartridge based program without needing the additional expense of a mother board. The RAMMASTER 32 features block selectable memory so that the user can change the memory map to meet his specific needs at that time.

Features include a write protect switch which protects programs, utilities, etc. from interference from BASIC, a pause switch which halts any program in progress, and a port for a pause/reset cable for more convenient positions.

The RAMMASTER 32 also features complete easy, to understand documentation and a help line. For those who have any questions, call 1-800/2-ADD-RAM.

The RAMMASTER 32 suggested retail price is $129.95 and is available now.

Mosaic Electronics Circle No. 263
P.O. Box 708
Oregon City, OR 97045
503-653-7885 1-800-2-ADD-RAM

TYPING GAME FOR C-64

Learn typing skills in a video game space war format with MasterType from Lightning Software, on C-64 disk.

MasterType consists of 18 progressive lessons allowing the user to develop mastery of the keyboard at an individual rate. Each row of keys is separately introduced, presenting individual keys first and building up to words. After each lesson, the game reports the number of words typed per minute and words misspelled or destroyed.

The MasterType package includes a manual with directions for running the program, descriptions of the options and educational implications, hints for winning the game, finger charts, suggestions for successful touch-typing, directions for customized lessons and description of the 18 preprogrammed lessons.

Price: $39.95. For more information, contact Bruce Zweig, Lightning Software, 480 California Ave., Palo Alto, CA 94306 (415) 327-3280. Circle No. 264

PARALLEL PRINTER INTERFACE

The DATA 20 Parallel Interface is an easy way to use a parallel printer with a Commodore computer. This device takes advantage of the same technology that produces LCD watches and calculators. There are no awkward ribbon cables or boxes to worry about. With the attractive packaging format it appears to be a cable.

Features:

- Supports the Commodore standard handshaking protocol–appears to the system as a 1525 printer.
- Translates the Commodore character set to ASCII.
- Passes through graphics character.
- Does not use power from the computer, the printer, or any external supply.
- Easy to use–simply plug it in, no software to load or switches to configure.

Retail price: $49.95. Available from DATA 20 Corporation, 23011 Moulton Parkway, Suite B 10, Laguna Hills, CA 92653 (714) 770-2366. Circle No. 265

ZEPPELIN RESCUE

ZEPPELIN RESCUE, on disk and cassette for the Commodore 64, takes you through the five different cityscapes on your rescue mission. You must maneuver your way through the city, flying from the tops of buildings to the piers beneath suspension bridges to save the city dwellers before its too late. As you rescue the inhabitants of Los Angeles and your space-ship takes off, you then advance to progressively more difficult screens-starting with daylight, going through dusk, night and finally, dawn.

ZEPPELIN RESCUE is available for $19.95 on cassette and $24.95 on disk. For additional information, contact: Micro Software International, The Silk Mill, 44 Oak Street, Newtown Upper Falls, MA 02164 (617) 527-7510. Circle No. 266

STATISTICS PACKAGE

Kobetek Systems Limited is pleased to announce the availability of SPP (Statistics for Personal Computers), a sophisticated statistical software package for Commodore 4000, 8000, and 64 series.

The package is menu-driven and includes: descriptive statistics; cross-tabulations; correlations; linear, cubic and quadratic regression; multiple regression; one-way and two-way ANOVA (unbalanced if desired); as well as non-parametric statistics.

Data can be displayed in the form of histograms, scatter plots, normal probability plots, box diagrams and tables.

Available from:

KOBETEK SYSTEMS LIMITED
1113 Commercial Street
New Minas, NS
B4N 3E6 Circle No. 267
(902) 678-9800

Prices range from $350.00 to $500.00 for complete packages.

CARIBBEAN ISLANDS BULLETIN BOARD

The first Bulletin Board System (BBS) dedicated to residents of the Caribbean has been established in Puerto Rico. Commodore User Group president, Julio Martinez, reports the BBS is up and running a Steve Punter version, modified for Commodore and a TNW modem. The system's hours of operation are from 8 PM to 8 AM daily. The telephone number is (809) 781-0350.

Sysop Martinez says most users exchange programs and club information notices. He invites callers from the mainland to log on.

GET THE BEST FOR YOUR COMMODORE 64

BUSINESS

* **FINANCE CALC 64** • Disk	$45.95
* **DATA BASE 64** • Disk	49.95
* **MANAGEMENT SYSTEM 64** • Disk	45.95
* **FAMILY PAC 64 (3 in 1)** • Disk (CHECKBOOK, RECIPE, EDU-GAME)	45.95
* **CHECKBOOK EASE 64** • Disk	29.95
HESWRITER 64 • Cart.	29.95
HESMON 64 • Cart.	25.95
HES MODEM • Cart.	67.95
TURTLE GRAPHICS II • Cart.	39.95
QUICK BROWN FOX (W.P.) • Cart.	45.95
WRITERS ASSISTANT (W.P.) • Disk	59.95
FILING ASSISTANT • Disk	67.95
INVENTORY PACKAGE • Disk	77.95
TOUCH TYPING TUTOR • Disk & Cass.	18.95
CALC RESULT EASY • Cart	67.95
CALC RESULT ADVANCED • Disk	127.45
PAPERCLIP (W.P.) • Disk	99.95
M'FILE • Disk	94.95
WORD PRO/3 (W.P.) • Disk	71.95
SPELL RIGHT PLUS (DICTIONARY) • Cart.	49.95
DELPHI'S ORACLE (DATA BASE) • Disk	125.95
TIME & MONEY MANAGER • Disk	55.95
OMNICALC (SPREADSHEET) • Disk	79.95
CARDCO PRINTER INTERFACE	54.95

EDUCATIONAL

HUNDREDS MORE AVAILABLE

SNOOPER TROOPERS I, II • Disk	$29.95
KINDERCOMP • Disk & Crt.	19.95
IN SEARCH OF MOST AMAZING THING • Disk	26.95
PROGRAMMING KIT I • Disk	19.95
FACEMAKER • Disk	22.95
KIDS ON KEYS • Cart.	29.95
FRACTION FEVER • Cart.	29.95
PIPES • Cart.	29.70
ENGLISH INVADERS • Disk & Cass.	21.95
DUNGEONS ALGEBRA DRAGONS • Disk & Cass.	19.95
UP FOR GRABS • Cart.	29.95
BENJI'S SPACE RESCUE • Disk	29.95

ENTERTAINMENT

* **STUDIO 64** (MUSIC MAKER) • Disk & Cass.	$29.95
* **GAME DESIGNER** • Disk & Cass.	25.95
GRIDRUNNER • Cart.	20.25
TEMPLE OF APSHAI • Disk	25.95
UPPER REACHES OF APSHAI • Disk	13.50
CURSE OF RA • Disk	13.50
ASTROBLITZ • Cart.	29.20
SAVE NEW YORK • Cart.	29.70
PERSONALITY ANALYZER • Disk	28.00
PHANTOM KARATE DEVILS • Disk	29.70
PLANETFALL • Disk	38.20
ENCHANTER • Disk	38.20
SEA FOX • Disk	33.95
CHOPLIFTER • Disk	33.95
PROTECTOR II • Disk & Cass.	24.95
TELENGARD • Cass.	16.95
FROGGER • Disk & Cass.	22.95
FORT APOCALYPSE • Disk & Cass.	22.95
ROBBERS OF THE LOST TOMB • Disk	19.95
JUMPMAN • Disk	25.95
SWORD OF FARGOAL • Disk & Cass.	20.25
PAKACUDA • Disk & Cass.	11.95
SURVIVOR • Disk & Cass.	22.95
PEGASUS ODYSSEY • Disk & Cass.	19.95
NEUTRAL ZONE • Disk & Cass.	27.95
COMPETITION PRO. JOYSTICK	17.95

POLICY

All orders are shipped U.P.S. Shipping charges are $2.00 for prepaid orders and $3.25 for C.O.D. For fast delivery send money order, certified check or credit card.
Please allow approximately three weeks for clearance on personal checks.
All items are subject to availability and price change. Thanks for ordering from House of Software! Call for free catalog!

HOUSE of SOFTWARE

*From EN-TECH Software

To Order Call:
(213) 768-8866
Or
Write To:

VISA MasterCard

HOUSE OF SOFTWARE
9183 Mercedes Ave. • Arleta, CA 91331

A-V Graphics N. Hollywood

SHOW US A BETTER PRICE AND WE'LL BEAT IT!

IF IT'S FOR THE COMMODORE 64 AND IT'S GOOD, IT'S PROBABLY

ENTECH®

MANAGEMENT SYSTEM 64
This integrated business program gives you the computer power once reserved for large corporations. Capabilities include invoicing, inventory control, and customer mailing lists. Disk **$69.95**

FINANCE CALC 64
The leader in home and business financial analysis. You can have up to 1440 itemized expenses and print 1085 different financial reports and bar graphs. In addition, it keeps and compares as many as 12 budgets at once. Disk **$59.95**

DATA BASE 64
A perfect record system for any business or home. It can store up to 1200 records and has up to 20 fields for each one. A special label and report designer is included. It can also merge with popular word processors. Disk **$59.95**

GAME DESIGNER 64
Use to animate 16 sprites and design colorful background screens. Several game sub-routines included. Disk **$35.95**

STUDIO 64 SERIES
Anyone can now create music as beautiful as the most advanced programers could one year ago!! Just play and the computer will instantly write the music on the screen. Included are powerful features like block move, single note editing and scrolling. It will save and recall, add music to your own programs and print lead sheets. Disk **$39.95**

FAMILY PAK (3 in 1) **(ALL) $55.95**
Three of the finest home programs available:

- **CHECKBOOK EASE 64**
  Handles over 1300 transactions. Prints statements, and all types of checks, and 40 expense categories. **$39.95**
- **RECIPE KEEPER**
  Searches by ingredient, category or name. Calculates measurements for different serving amounts and prints copies.
- **SPACE MATH 64**
  Learn math, explore the universe, dance to the music and watch the show.

BABIES OF THE DIRT
An earthquake sucks you to the center of the earth. To escape you must battle the BABIES OF THE DIRT. But, don't miss or its doomsday! Watch out for their mother. **$39.95**

Circle No. 106

NOTE: PROGRAMS ARE COMPATIBLE WITH ALL PRINTERS AND UTILIZE FULL-SCREEN PROCESSING.

A-V Graphics, N. Hollywood

P.O. BOX 881, SUN VALLEY, CA 91353 • [213] 768-6646

It's time for your computer to grow up.

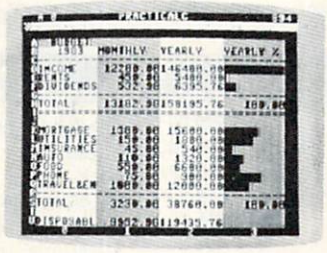
Meet PractiCalc.™ The world's most versatile spreadsheet at only $40.*

Games are fun when it's time to play. But at heart, your Commodore 64™ or VIC-20™ is a full-grown computer straining to gallop at the touch of your fingers.

Commodore 64 and VIC-20.
Not just for games...

But the problem is, most software's been designed for toys. Not for real computers. Until now.

Now comes PractiCalc. And there's not much in the world of grown-up computing it won't do. It'll keep addresses (in alphabetical or numerical order), phone numbers (likewise), make budgets and menus, project profits, keep track of expenses, inventories, investments, what have you. For your home, your school, your business.



Budgets, inventories,
projections, you name it...

Spreadsheet analysis...

PractiCalc gives you everything you'd expect from a spreadsheet, like adding and subtracting, multiplying and dividing, calculating square roots, logarithms, exponential numbers and even trig functions. And PractiCalc gives you a lot more.

High or low
resolution graphics...

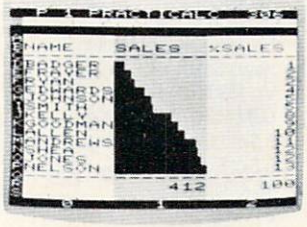
Want to make a chart? Hit a key and the high or low resolution graphics of PractiCalc Plus or PractiCalc 64 will turn numbers into graphs. It'll even print out everything that shows on the screen.

Want a lot of facts and figures at your fingertips? PractiCalc stores more than 2,000 cells in up to 100 columns and 250 rows. It'll sort them, search them, or shuffle them for you.

High-speed and
wild card search...

You can add entries, delete them, or move them around –numerically or alphabetically, and instantly, of course. And you'll find PractiCalc unusually friendly, flexible, and forgiving.

All of which is a far cry from just playing with a joystick. Still, PractiCalc has one thing in common with a computer game. The price. Only $40.



Alpha or numeric sort...

PRACTICALC™ by COMPUTER SOFTWARE ASSOCIATES, INC.

Exclusively distributed by **Micro Software International, Inc.**
The Silk Mill, 44 Oak Street, Newton Upper Falls, MA 02164 • (617) 527-7510

*$40 is suggested retail price for tape version of PractiCalc-20 ($45 for disk version; PractiCalc Plus or PractiCalc 64 = $50 for tape version, $55 for disk).

© 1983 Computer Software Associates, Inc. Commodore 64™ and VIC-20™ are trademarks of Commodore Business Machines, Inc.

Circle No. 91

MICRO-SYS DISTRIBUTORS. THE COMMODORE CONNECTION.

commodore

SOFTWARE FOR C-64

Business

Multiplan	$ 89.00
WordPro 3 + /64 w/SpellRight Plus	$ 79.00
SpellRight Plus	$ 55.00
Easy Script	$ 45.00
Calc Result (Advanced)	$ 125.00
Calc Result (Easy)	$ 75.00
Mirage Concepts (65000 records)	$ 95.00
M-File (merge w/wordpro)	$ 89.00
Home Accountant (Continental)	$ 69.00
Code Writer (writes basic programs)	$ 95.00
Easy Finance	$ 22.00
Complete Accounting G/L, A/R, A/P, P/R, INV	$ 75.00

Entertainment

Assembler Package (cassette or disk) (compiled, includes editor, loader, disassembler)	$ 39.00
Sprite Master	$ 30.00
Neutral Zone	$ 35.00
Vic Tree (programmers utilities)	$ 75.00
Commander Ultra (terminal package)	$ 59.00

ACCESSORIES

MSD Super Disk (Single)	$ 395.00
MSD Super Disk (Dual)	$ 695.00
80 Column Expander	$ 55.00
Vic 1600 Modem	$ 75.00
Vic 1650 Modem	$ 109.00
Hayes Smart 300 Modem	$ 249.00
Hayes Smart 1200 Modem	$ 629.00
Vic 1530 Datasette	$ 60.00
CBM 1520 Printer Plotter	$ 179.95
5 Slot Expander (64)	$ 65.00
6 Slot Expander (vic)	$ 70.00
16 K Ram (vic)	$ 70.00
64 Relay Cartridge	$ 45.00
Numeric Key Pad (vic & 64)	$ 35.00
Programmers Ref Guide	$ 18.00
Alien Voice Box (Talks & Sings)	$ 89.00
Verbatim Diskettes:	
Single Sided/Single Density	$ 26.00
Single Sided/Double Density	$ 30.00
Double Sided/Double Density	$ 42.00
Texas Instruments LCD Programmer	$ 55.95

INTERFACES

Interpod (full compatibility!!) (Intelligent IEEE & RS232)	Call
The Connection (full graphics of 64)	$ 95.00
Cardco Parallel Interface	$ 70.00
RS-232 Communications Interface	$ 45.00
Vic Switch	$ 149.00
ADA 1800 (Parallel)	$ 129.00
ADA 1450 (Serial)	$ 149.00
Pet-to-IEEE Cable	$ 39.00
IEEE-to-IEEE Cable	$ 49.00
4 Prong A/V Cable	$ 15.00
Custom Computer Cables (we make to your specifications)	Call

MONITORS

CBM 1702 Color Monitor	$ 249.00
Panasonic CT-160 Color	$ 279.00
Panasonic TR-120 Green Screen	$ 169.00
Panasonic TR-120 Amber Screen	$ 179.00
Amdek Color Plus	$ 295.00
Amdek 300A	$ 175.00

LETTER QUALITY PRINTERS

Transtar 120 (80 column)	$ 495.00
Transtar 130 (132 column)	$ 769.00
CBM 6400 Printer	$1425.00
NEC Spinwriter	Call

DOT MATRIX PRINTERS

CBM 1525 30 cps.	$ 235.00
CBM 8023 150 cps.	$ 539.00
CBM 4023 100 cps. (IEEE)	$ 339.00
CBM 1526 100 cps. (serial)	$ 349.00
Epson MX-80 FT 80 cps.	$ 549.00
Epson RX-80 120 cps.	Call
Epson FX-80 160 cps.	Call
Epson FX-100 160 cps.	Call
Okidata 92 (Parallel)	$ 559.00
Panasonic KX-P1090 Printer	$ 475.00
Star Gemini 10X	$ 329.00
Star Gemini 15	$ 499.00

COMMODORE BUSINESS MACHINES

Executive 64 portable (new)	Call
B128-80 128k Bus. Machine (new)	Call
SuperPet (5 languages)	$1059.00
CBM 8032	$ 625.00
CBM 2031 single disk	$ 295.00
CBM 8050 Dual Disk 1 meg.	$ 995.00
CBM 8250 Dual Disk 2 meg.	$1295.00
CBM D9060 Hard Disk 5 meg.	$1995.00
64K Expansion Board	$ 275.00
SuperPet Upgrade Kit	$ 695.00

BUSINESS SOFTWARE — 8032

WordPro 4 + or 5 +	$ 305.00
Visicalc	$ 199.00
The Manager	$ 199.00
BPI Accounting System (5 separate modules)	$ 325.00
Southern Solutions Accounting System III (Per/Module)	$ 285.00

BUSINESS SOFTWARE — B128-80

Superscript II	Call
Superbase	Call
Superoffice	Call
Complete Accounting Systems	Call
Mail Pro	Call
Cross Compilier (Oxford)	Call

TERMS

Orders under 50.00 add 10.00 Handling fee
MasterCard, VISA, Money Order, Bank Check
COD (add 5.00)
Add 3% For Credit Cards
All Products Shipped Within 24 Hours
F.O.B. Dallas, Texas
All Products Shipped With Manufacturers
90 Day Warranty

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.
DEALERS INQUIRIES WELCOME

Call to Order
1-800-527-1738
All Others Call
1-214-231-2645

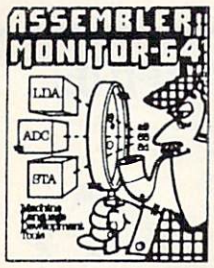
Micro-Sys
DISTRIBUTORS

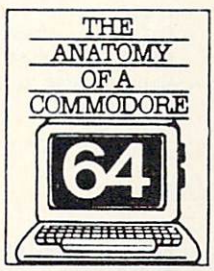
Circle No. 94

641 Presidential Drive • Richardson, Texas 75081 • 9:30 a.m.-6:30 p.m. (Mon.-Fri.) • 10:30 a.m.-2:30 p.m. (Sat.)

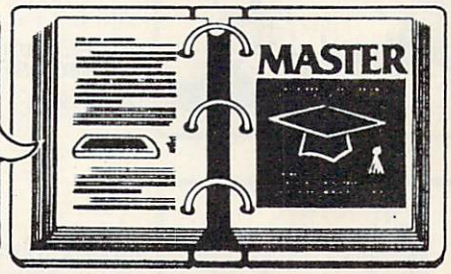
GET THE MOST OUT OF YOUR COMMODORE-64 OR VIC-20 COMPUTER

ALSO AVAILABLE:
3 outstanding Music Albums to go with Synthy-64
Classical
Christmas and
Rag/Sing Along
See below





BRAND NEW!
PROFESSIONAL DEVELOPMENT SOFTWARE FOR QUALITY APPLICATIONS
See below



ULTRABASIC-64...Add 50 commands: graphics, music, TURTLE and game features. Tutorial, demo plus. **TAPE $39.95 DISK $42.95**

SYNTHY-64... Sets the standard for all of the rest. Best 64-synthesizer anywhere. Samples and manual. **CASSETTE $29.95 DISK $32.95.** Also available: 3 great companion music albums; **Classical, Christmas,** and **Ragtime Sing-Along. DISK $12.95 Each.**

CHARTPAK-64...Professional qualtiy pie, line and bar charts. Menu driven, interactive, hardcopy. **DISK $42.95**

ZOOM PASCAL-64...Produces 6502 machine code for speed. Floating point, Integers, strings File handling. **DISK $39.95**

SUPER DISK UTILITY-64... Speed copy 4 ways: Total, Bam, Append or File. Dump or modify sectors. More. **DISK $22.95**

ASSEMBLER-MONITOR-64 High speed language development. Eleven function monitor. Screen editing of source file. **DISK $32.95**

GRAPHICS DESIGNER-64... Menu-driven drawings, floor plans and illustrations etc.. Slide program capability. **DISK $32.95**

TINY FORTH-64/20...Exciting language-low price. Powerful, extensible, 200 + word vocabulary. **TAPE $24.95 DISK $27.95**

SKIER-64...This arcade-quality game adds hours of action and excitement to your Commodore-64. **TAPE $14.95 DISK $17.95**

POOL-64/20...Play Fullrack or nine ball using hires graphics. Vic-20 required 8K expander. **TAPE $14.95 DISK $17.95**

SCREEN GRAPHICS-64 Adds 24 hires, multicolor, sprite commands to 64-BASIC. Demo, tutorial and manual. **TAPE $24.95 DISK $27.95**

DATAMAT-64...Simple powerful data base management with search, sort, report capability at low price. **DISK $32.95**

CHECKBOOK MANAGER-64 Simple check account maintainance. Optional screen or printer report and backup. **DISK $22.95**

ANATOMY OF A COMMODORE-64 Complete guide. Full comment ROMS list, detailed internals, descriptions. **300 PAGE BOOK $19.95**

MASTER-64...Full ISAM file management; powerful screen management; excellent printer generator; programmer's aid; BASIC 4.0 commands; machine language monitor; Software developers: NO RUNTIME ROYALTIES; With 150 page manual in three-ring binder and development software. **SOFTWARE ON DISK $84.95**

*** DEALER INQUIRIES INVITED**

FREE CATALOG **Ask for a listing of other Abacus Software for Commodore-64 or Vic-20**

DISTRIBUTORS

Great Britain:
ADAMSOFT
18 Norwich Ave.
Rochdale, Lancs.

West Germany:
DATA BECKER
Merowingerstr. 30
4000 Dusseldorf
0211/312085

Great Britain
CCI Software
167 Great Portland St.
London WI
01-636-6354

Sweden:
TIAL TRADING
PO 516
34300 Almhult
476-12304

Canada East:
KING MICROWARE LTD.
5950 Cote des Neiges
Montreal, Quebec H3S 1Z6
514/737-9335

Australia:
CW ELECTRONICS
416 Logan Road
Brisbane, Queens.
07-397-0808

Canada West:
L.S.I. Distributors Ltd.
810 W Broadway #163
Vancouver, BC V5Z 4C9
604/733-0211

New Zealand:
VISCOUNT ELECTRONICS
306-308 Church Street
Palmerston North
63-86-696

AVAILABLE AT COMPUTER STORES, OR WRITE:

Abacus Software

P.O. BOX 7211 GRAND RAPIDS, MICH. 49510

For postage & handling, add $1.50 (U.S. and Canada), add $3.00 for foreign. Make payment in U.S. dollars by check, money order or charge card. (Michigan Residents add 4% sales tax).

FOR QUICK SERVICE PHONE 616-241-5510

Circle No. 69

AARDVARK LTD.

NOW THE BEST COST LESS

DUNGEONS OF DEATH - A serious role playing game for up to 6 players. You get a choice of race and characters that grow from game to game. You also get a graphic maze and a 15 page manual.

Available On: TRS80C 16K EXT., CMD64, VIC20 13K, IBMPC, TRS80C 32K, MC10 16K

TAPE $14.95 DISK $19.95

BAG-IT-MAN - The ultimate arcade game for TRS80C or MCD64. This one has three screens full of BAGS OF GOLD, CARTS & ELEVATORS TO RIDE IN, MINE SHAFTS, and TWO NASTY GUARDS. Great sound and color and continuous excitement.

Available On: TRS80C 32K, CMD64

TAPE $19.95 DISK $24.95

QUEST - A different kind of Graphic Adventure, it is played on a computer generated mape of Alesia. You'll have to build an army and feed them through combat, bargaining, exploration of ruins and temples, and outright banditry! Takes 2 - 5 hours to play and is different each time.

Available On: TRS80C 16K, CMD64, VIC20 13K, MC10 16K, TI99 (EXT. BASIC), IBMPC

TAPE $14.95 DISK $19.95

STARFIRE - If you enjoyed StarRaiders or StarWars, you will love Starfire. It is not a copy, but the best shoot-em-up, see them in the window space game on the CMD64 or TRS80C. The fantastic graphics will put you right in the control room as you hyperspace from quadrant to quadrant fighting the aliens and protecting your bases.

Available On: TRS80C 16K, CMD64

TAPE $19.95 DISK $24.95

WIZARDS TOWER - A fantasy game played on a map of forests and dungeons - with dragons and wizards to kill. Similar to QUEST and fun for adults, but a little simpler and playable for the younger set (8 - 60).

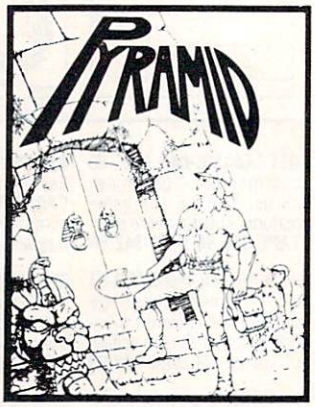
Available On: TRS80C 16K EXT., CMD64, VIC20 13K, TI99, IBMPC

TAPE $14.95 DISK $19.95

PYRAMID - ONE OF THE TOUGHEST ADVENTURES. Average time through the pyramid is 50 - 70 hours. Clues are everywhere and some ingenious problems make this popular around the world.

Available On: TRS80C 16K, CMD64, MC10 16K, TIMEX, IBM PC, TI99, VIC20 13K

TAPE $14.95 DISK $19.95



AARDVARK offers over 120 original high quality programs. Send one dollar for a current catalog and receive a $1.00 gift certificate good towards your next purchase.

Authors - **AARDVARK** pays top dollar for high quality programs. Send a copy today for a personal review and editorial help.

TO ORDER: Send amount indicated plus $2.00 shipping, per order. Include quantity desired and your preference of tape or disk. Be sure to indicate type of system and amount of memory. When using charge card to order by mail, be sure to include expiration date.

MasterCard CHARGE CARDS WELCOME VISA

1-313-669-3110

PHONE ORDERS ACCEPTED
8:00 a.m. to 8:00 p.m. E.S.T., MON-FRI

AARDVARK *Action Software*

2352 S. COMMERCE • WALLED LAKE, MI 48088 • (313) 669-3110

Circle No. 1

CMD64 / TRS80C / IBMPC / VIC20 / TI99

Now You Have Three Choices of PILOTS for Your Commodore

Compare for Yourself

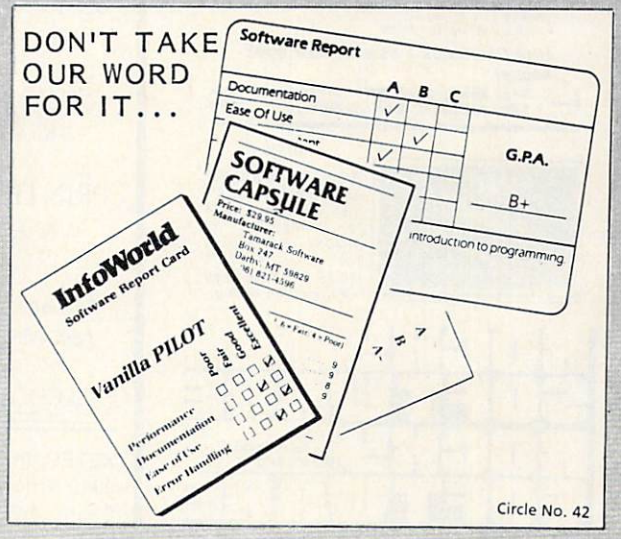
	VANILLA PILOT from Tamarack Software	PILOT II from Tamarack Software	PILOT from Commodore Business Machines
Price Retail	$29.95	$49.95	$59.95
Software	User friendly (19 descriptive error messages). 30 k left for programming.	User friendly (23 descriptive error messages). 21-29 K left for programming.	Not user friendly (cryptic one- letter error messages). 12 K left for programming.
Manual	124 pages Tutorial (Hands on, beginning with the very basics). Many examples. Good for novice & experienced programmers.	220 pages* Tutorial (hands on, beginning with the very basics). Many examples. Good for novice & experienced programmers.	111 pages Written as a reference manual. Few examples. Good for experienced programmers.
Turtle	Yes, true Turtle Graphics can face turtle any of 360°. Lo resolution.	Yes, two Turtle Graphics modes each can face turtle any of 360°. Hi and lo resolution.	No, not true Turtle Graphics (Lines drawn require beginning and ending points). Hi resolution only.
Sprites	No	Yes. Built-in Sprite editor. Allows interactive development.	Yes, but the actual sprite can't be seen until program is RUN.
Editing	Edit any line at any time after listing. Resident screen editor fully utilized. Global features include FIND, CHANGE, RENUMBER.	Same as Vanilla Pilot.	One line at a time - in edit mode only. Resident screen editor not fully utilized.
Debugging	Both immediate and deferred mode trace.	Same as Vanilla Pilot.	None.
Program Code Protection	None.	STUDENT command locks the program code.	Separate Run-time module.
Variables	26 Numeric variables. 2 strings. No system variable.	26 Numeric variables. Allows 8 characters string names (over 22 billion possibilities) 9 system variables.	26 Numeric variables. Limited to 26 strings because of character string name. 1 system variable.

* Estimated as of October 20, 1983.
Final count may vary slightly.

If you are like most people, you'll realize thet VANILLA PILOT is a 'best buy' especially since it is compatible with PILOT II.

PILOT II is a professional level programming language capable of handling your largest programming projects.

Why not pick up your copy of VANILLA PILOT or PILOT II from your local Commodore dealer or software outlet today?



Circle No. 42

Tamarack Software
Darby, MT. 59829

MICRO-MATE™

Sensibly priced desk-top accessories to organize and integrate your personal computer system.

Don't get stuck with a cheap wire stand. Avoid the static that plastic can generate. MICRO-MATE™ accessories are heavy gauge aluminum. Standard and expanded units slide forward providing access and storage for plug-in devices.

Expanded unit has multiple outlets and switch convenience.

STANDARD (Base/Monitor Stand)	$29.95
EXPANDED (Elec. Base/Monitor Stand)	49.95
PRINTER STAND	24.95
DISC DRIVE STAND	19.95
MONITOR STAND	19.95

(plus $4.00 shipping and handling)

Call now toll free 1-800-824-7888 Ask for operator 319 MASTERCARD, VISA OR C.O.D.

Circle No. 230

THE WIZARDS

present

THE ACCOUNTING TUTOR THAT GROWS AS YOU GROW!

☆ THE ACCOUNTING TUTOR ☆

(This package uses the same design concepts as are found in expensive artificial intelligence systems.)

Manual and disk for the Commodore-64™ only $64.95.

The Wizards, P.O. Box 7118, The Woodlands, Texas 77387

(Commodore-64 is a trademark of Commodore Electronics, Ltd.)

Circle No. 155

Get More From Your PET/CBM!

NEW! ● **24K MEMORY EXPANSION** ($129-$239)
Give your PET/CBM a boost to 32K!
Loaded with nifty features. Low, low power.

● **"Real World" SOFTWARE** ($17 - $25)
Word Processor, Mailing List, Catalog, Ham Radio, Frequency Counter.
"OLD" 8K PETs

● **2114-TO-6550 RAM ADAPTER** ($12-$25)
Replace 6550 RAMs with low cost 2114s. *Hundreds Sold!*

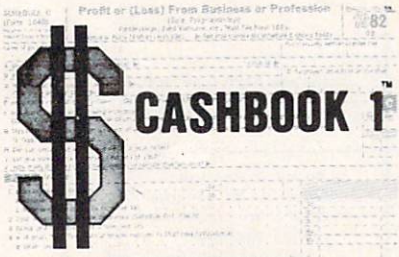
● **4K MEMORY EXPANSION** ($16 - $62)
Low cost memory expansion using 2114s for bigger programs.

Write for FREE Catalog!

Professional Products at Personal Prices
OPTIMIZED DATA SYSTEMS
Dept. O, P.O. Box 595 - Placentia, CA 92670

DISK-O-MATE trademark Optimized Data Systems -- PET/CBM trademark Commodore

Circle No. 31



CASHBOOK 1™

CASHBOOKKEEPING.....

for any small business with a Commodore 64™, & 1540/41 Disk Drive. (printer optional)

- 1040 Schedule C Format.
- Contractors, Professionals, Small Business.
- P & L Each Month & Year To Date.
- Profit Ratios, Owner's Position, Net Currency & Check Book Balance.
- All In Just Minutes Each Month.

Hire Cashbook 1 as your new bookkeeper.

Send $65 or call toll free order desk 1-800-321-6927. 24-Hour Service

The Computer Classroom™

- Also -

Programs for VIC20™ and Commodore 64™ disk or tape. Write for listing. OR, try MOUSE TRAP MATH, for your VIC20™ (10.95 for tape) and we'll include listing.

ROCKY SOFTWARE

Box 310
Erie, Colorado 80516
(303) 652-2103

Circle No. 143

Quality

for the Commodore

8K RAM CARD . . . $ 49.95* — VIC 20® 8K memory expander	EXPANDER 3 . . . . . $ 29.95* — VIC 20® 3 slot expander
32K RAM CARD . . . $119.95* — VIC 20® 32K memory expander	EXPANDER 6 . . . . . $ 49.95* — VIC 20® buffered 6 slot expander
PRINTER CARD . . . $ 69.96* — VIC 20® parallel printer interface	EXPANDER 4 . . . . TBA — C 64® 4 slot expander

Available at finer Software Stores everywhere or call 1-800-255-0511 for the name of your local dealer or distributor.

* Suggested Retail Price

VIC 20 & C 64 are TM of Commodore Business Machines, Inc

XETEC, Inc.
3010 Arnold Rd.
Salina, KS 67401

XETEC

Dealer and Distributor inquiries welcome

Circle No. 183

Advertisers Index

Take COMMAND by patronizing our advertisers who support the wide selection of products for the Commodore computer line. *COMMANDER* Magazine would appreciate you mentioning our name when dealing with these organizations.

Circle No.		Page No.
1	Aardvark	140
69	Abacus Software	139
2	Academy Software	24
89	Advanced Processor Systems	119
101	Alien Group	121
161	American Made Software Co.	103
37	Apropos Technology	44, 109
102	Arfon Microelectronics	54, 107
208	Automated Training Systems	59
162	Basic Byte, Inc.	92
68	Basic Electronic Business Systems, Inc.	101
203	Beaver Software Systems	71
3	Boston Educational Computing, Inc.	79
223	Broderbund Software	31
50	Bytes and Pieces #1	54
154	Cardinal Software	76
6	CGRS Microtech	103
164	Cheatsheet Products	59
213	Commodore	Inside Back Cover
10	Computer Alliance	97
41	Computer Learning Center	128
185	Computer Mat	62
12	Computer Mat	110
217	Computer Management Corporation	82
103	Computer Network	69
91	Computer Software Associates, Inc.	137
49	Cosmic Computers	133
105	Cosmopolitan Software Services, Ltd.	23
170	Covox Co.	48
44	Creative Software	10, 11, 12, 13
202	Databar	8
205	Datasoft	7
67	Double E Electronics	95
159	Dynatech Microsoftware Inc.	90
14	Eastern House	58, 117
130	Elcomp Publishing, Inc.	42
184	Electronic Lab. Industries.	25
40	Fabtronics	54
17	French Silk	71
166	General Systems Consulting	71
204	Geneva Technologies Corp.	47
19	Gloucester Computer	28
16	GOSUB of Slidell, Inc.	69, 94
108	H & E Computronics	Inside Front Cover
220	Handic Software Inc.	144
106	House of Software	136
107	Human Engineered Software	1
95	ICD Corporation	123
52	Info Designs	16
21	Intelligent Software	56
97	JMD Enterprises	60
169	Knight Writer Software	81
171	Krell	33
214	Ksoft Co.	51
22	Leading Edge Products, Inc.	Back Cover
172	Limbic Systems, Inc.	131
209	Loop Software	55
70	Lynn Computer Service	102
174	Macrotech Marketing	88

Circle No.		Page No.
99	(M)agreeable	92
222	Merritt Software, Inc.	56
226	Microclear	19
28	Microspec	127
224	Micro-80 Inc.	19
94	Micro-Sys Distributors	138
173	MicroTechnic Solutions	105
55	Micro-Ware Dist. Inc.	18, 25, 124
25	Midwest Micro, Inc.	114
56	Mystic Software	82
229	National VIC-20 Users Group	121
218	Northland Accounting, Inc.	72
137	Obbligato	55
64	Omnitronix	117
228	Omnitronix	69
31	Optimized Data Systems	142
32	Performance Micro Products	121
75	Phantom Software	2
177	Practical Programs, Inc.	85
215	Professional Micro Services	121
58	Progressive Peripherals and Software	113, 130
76	Pro-Line Software	17
34	Protecto Enterprizes	63, 64, 65, 66, 67, 68
35	Psycom Software International	76
47	Public Domain, Inc.	115
138	Public Domain Software Service	124
140	Pyramid Computerware	101
142	Quick Brown Fox	7
227	R. Redmond	132
77	Rees Software Laboratories	93
143	Rocky Software	142
144	Sail Software	82
221	Scarborough Systems, Inc.	15
232	Signal Computer Consultants	107
60	SJB Distributors Inc.	98
210	Skyles Electronic Works	26
38	Skylight Software	100
145	Soft Sacware	93
	Software Clearing House	61
207	Software Crafts	97
54	Southwest Micro Systems, Inc.	129
150	Subterranea Designworks	35
122	Superbyte Software	107
160	Superior Graphics Emporium	77, 95
149	Susie Software	100
212	Synapse	39, 40, 41
61	Systems Management Associates	21
	Tapes on Command	24
79	T & F Software	3
42	Tamarack Software	141
45	Toronto Pet Users Group, Inc.	101
46	TOTL Software, Inc.	117
201	UC Software	36
123	Universal Software	120
48	Victory Software	126
230	Waldinger Corporation	142
182	Wayne Green Publications	32
155	The Wizards	85, 142
183	Xetec	142
225	York 10	51

For the **Commodore 64**

32 pages, 64 columns and 254 lines, over 500,000 positions.

3 dimensional split-screen presentation for comparisons **and consolidation** on the last page.

4 page individual window comparison for focusing-on specific information.

Full color special feature for additional monitoring.

Instant calculation and automatic multiple calculation.

Easy-to-use histogram with full color for powerful presentations.

Easy-to-use printing commands of screens and histograms.

Easy-to-use help-screens with complimentary manuals to guide you through the most comprehensive and powerful spread-sheet programs available.

. . . . . No Spread-Sheet Program has so many features at . . . $149.95

by handic software inc.

The World's Largest Commodore Software Producer next to themselves. 50 million dollars in 1983. 80,000 sold in first 9 months of 1983. Distributed in nine languages in 27 countries.

handic software inc.

—a company in the Datatronic group—

Fellowship Business Center
Fellowship Road, B-206
Mt. Laurel, New Jersey 08054
Phone — (609) 663-0660

Circle No. 220

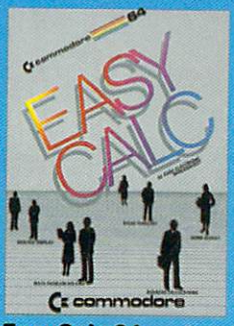
commodore 64

INDISPENSABLE SOFTWARE

For Your Most Important Computing Needs

EasyScript 64
Displays 764 lines × 240 characters. Prints to 130 columns. Works with EasySpell 64.

EasySpell 64
20,000 word Master Dictionary and automatic spelling checker. Works with EasyScript 64.



EasyCalc 64
Multiple electronic spreadsheet with color bar graph feature. 63 columns × 254 rows.

The Manager
Sophisticated database system with 4 built-in applications, or design your own. Text, formulas, graphics.

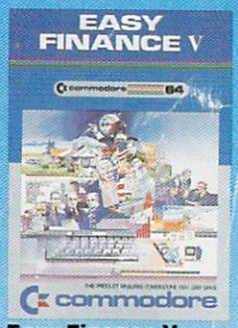
SuperExpander 64
21 special commands. Combine text with high resolution graphics. Music and game sounds.

Easy Finance I—Loan Analysis
12 loan functions. Bar graph forecasting as well as calculation.

Easy Finance II—Basic Investment Analysis
16 stock investment functions. Investment bar graph.

Easy Finance III—Advanced Investment Analysis
16 capital investment functions. Bar graphs.

Easy Finance IV—Business Management
21 business management features. Bar graphs.



Easy Finance V—Statistics and Forecasting
Assess present/future sales trends with 9 statistics and forecasting functions.

Accounts Payable/Checkwriting
11 functions. Automatic billing. 50 vendors/disk.

Accounts Receivable/Billing
11 billing functions. Printed statements.

General Ledger
8 general ledger options. Custom income statement, trial balances, reports.

Inventory Management
1000 inventory items. Full reports.

Payroll
24 different payroll functions. Integrated with G/L system.

commodore COMPUTERS

st In Quality Software

Circle No. 213

TS OF PERFECT MEMORY:
IE HALF EARTH DOLLARS
AT LAST: THE WHOLE TRUTH ABOUT FLOPPIES.
Amazing book reveals all!
How to keep from brainwashing your disk so it never loses its memory.
How fingerprints can actually damage disks. Unretouched Kirlian photographs of UFO's (Unidentified Floppy Objects)! The incredible importance of making copies: the Department of Redundancy Department—and what goes on when it goes on! Powerful secret methods that scientists claim can actually prevent computer amnesia! All this, and much more . . .
In short, it's an 80-page plain-English, graphically stunning, pocket-sized definitive guide to the care and feeding of flexible disks.
For The Book, ask your nearest computer store that sells Elephant™ disks, and bring along one and one-half earth dollars.
For the name of the store, ask us.
Elephant Memory Systems®
Marketed exclusively by Dennison Computer Supplies, Inc., 55 Providence Highway, Norwood, MA 02062. Call toll free 1-800-343-8413. In Massachusetts, call collect (617) 769-8150. Telex 951-624.
THE SECRETS OF PERFECT MEMORY